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Happy New Year to All.

TELEGRAPH AND TELEPHONE AGE wishes its many friends a Happy New Year and prosperity in the months to follow.

Government and Wireless.

The bill introduced in the House at Washington to strengthen government control of wireless communication would have a dampening effect on the development of the art in this country. In reality it means government competition with the existing company in ship to shore service and under such conditions no private company can do its best work. It seems to us that it would be far better to let the present radio laws remain unchanged, because some sort of harmony now exists between the Marconi company and the government interests. The former is continually improving the service by introducing new methods but it is questionable if the government would do as well if it controlled the field. Naturally there would be a lack of incentive and development would lag.

The proposed bill is looked upon as an entering wedge of government operation of the telegraph and the telephone and as such it would be a great misfortune if it should pass. The American spirit is opposed to monopoly in anything, and government control of the telegraph—wire and wireless—and the telephone would certainly mean deterioration of service and facilities, and the people would then have something to say regarding it.

Proposed Increase of Postage Rates Unfair.

The post office committee of the House of Representatives has reported favorably a rider to the regular post office appropriation bill increasing the postage rates on second class matter, which includes regular newspaper publications, as much as 600 per cent. While the government is turning its attention to the high cost of living in the interest of the public it is itself helping to make the situation more difficult for newspapers by proposing to increase the postage rates.

The proposed zone system of charging for postage is inequitable and the attempt to railroad the measure through as a rider is very unfair to the publishing interests. In our own case a large majority of our subscribers reside at distant points and the proposed increase would be severely felt.

The Year 1916.

In a review of events of the past year many things come to the attention that are worthy of note, although it can hardly be said that any epoch-making developments have been made. Progress has been steady and lasting, with the result that the arts of electrical communication are on a more scientific and reliable basis than ever before.

In telegraphy and telephony many improvements and noteworthy achievements have been made, the Western Union Company being particularly active in its work of creating and developing new applications for its service.

Many new commercial uses have been found for the night letter service of both telegraph companies, and on several occasions thousands of such messages have been filed by one interest to stimulate business. On one occasion, during the political campaign, the Postal Company handled 62,000 night letters of a political character from one source (April 23) to be delivered in Boston and vicinity within forty-eight hours. This great demand on its facilities was met with remarkable promptness.

Early in the year, in March and April, the completed building at 195 Broadway, New York, was taken possession of by the Western Union Telegraph Company and the American Telephone and Telegraph Company, and although it is a very spacious structure there is abundant evidence that there is already need for more room, the quarters are now so crowded. The building itself is magnificent and well designed for the purposes for which it is used, but the two lines of business are so rapidly expanding that more space will have to be provided to grow in. The old title "195 Broadway," by which the location was so long known, has been merged into a broader one and the building is now officially entitled Telephone and Telegraph Building.

Towards the close of the year it was announced that the Western Union Company proposed to enter South America for business. Large plans have been laid with that object in view, but up to the present time practically nothing definite has yet been done.

The age limit fixed by the Western Union Company has cut off from active service several prominent officials, including A. R. Brewer, A. G. Saylor, W. J. Lloyd, G. H. Fearons, W. H. Baker and others and these are now enjoying a well-earned rest after years of activity.

Death has been active in the ranks during the year, and many prominent and old time telegraph and telephone men have passed away. Among them may be mentioned Belvidere Brooks, J. B. Tree, Henry W. Pope, Henry H. Ward, Carleton Sprague and S. S. Garwood, and among others well known in the electrical world, Prof. Sylvanus P. Thompson of London.

The Postal Telegraph-Cable Company has made steady progress in every department throughout the year and is enjoying the largest volume of business it has ever experienced. It is making a high record for promptness of service and its operating staff is making remarkable records for speed and accuracy.

Extra compensation in a single payment for telegraph and telephone employes, to enable them to meet the high cost of living, was voted just before Christmas by the Western Union Telegraph Company and the American Telephone and Telegraph Company. This liberality on the part of the companies created a feeling of deep satisfaction among the employes.

The Federal tax of one cent on each telegraph and telephone message on account of the European war necessities was abolished in September, and the companies concerned were thus relieved of a great deal of extra work and trouble.

Steady progress has been recorded in telephone development. Long distance lines are being steadily extended and the excellence of service is noteworthy. In February long distance service between Montreal and Vancouver, B. C., was opened, the distance between the two points being 4,227 miles. In the United States the country has already been spanned by telephone, and it is now well nigh possible to find and pick out any one individual among the hundred million inhabitants in a few minutes at the most, no matter where he may be. Communication between New York and Seattle, Wash., was established by telephone February 1. This distance exceeds that covered the previous year, from New York to San Francisco.

Telephony between American and foreign territory will soon be an accomplished fact when service between the United States and Havana, Cuba, will be inaugurated.

Noteworthy developments have been made in wireless telephony. On May 6, on a test, the Secretary of the Navy sent orders from his office at Washington to war ships at sea by wireless telephone. The demonstration, it is said, was very successful.

One of the most notable achievements in cable-telegraphy during the year was the development of a new method of operating submarine cables which greatly increases the speed of transmission—practically 125 per cent.—and this is not the limit. The inventor of the system, Mr. T. B. Dixon, asserts that there is evidently no limit to the speed with which signals can be transmitted through a cable, its accomplishment being a matter of refinement of apparatus.

In wireless, the newest member of the telegraph family, great progress has been made. Service between the United States and Japan was opened November 15, when messages of congratulation were exchanged between President Wilson and the Emperor of Japan. This event was fully described in our December 1 issue.

The Marconi company has in every way shown its progressive and national spirit and assisted the government in the mobilization of United States troops on the Mexican border by allowing its employes to enter the military service and paying them during their absence. It has also established a life insurance plan for the benefit of its employes along liberal lines.

In July the Marconi company brought suit against the United States government for infringement of certain of its patents, and claimed damages to the extent of $1,000,000. The suit is now before the Court of Claims.

The business outlook for the year 1917 for the telegraph and telephone is most promising, and it is hoped that all expectations in this direction may be realized. All companies are prepared to handle a heavy business, so well organized are they, and there is every reason to believe that the year will be the most prosperous ever enjoyed by telegraph, telephone, cable and wireless companies alike.

Telegraph and Telephone Patents.

ISSUED DECEMBER 5.

1,206,845. Fire-Alarm System. To George W. Hochsprung, Brooklyn, N. Y.

1,206,881. Method of Making Diaphragms. To Henry C. Miller, Waterford, N. Y.

1,206,911. System of Radio Communication. To G. W. Pickard, Amesburg, Mass.

1,207,051. Telephone Repeaters or Relay. To Arcy H. Johnson, Pulaski, Tenn.

1,207,090. Means for Ventilating Telephone Booths. To Eben J. Stevenson, Boston, Mass.

1,207,150. Automatic Telephone Switching System. To Alfred H. Dyson, Montclair, N. J.

1,207,382. Primary Battery. To Thomas A. Edison, Llewellyn Park, West Orange, N. J.

1,207,463. Disconnecting Device for Telephones. To Charles H. Alger, Manchester, Okla.

ISSUED DECEMBER 12.

1,207,836. Connecting System for Telephone Stations. To Leon D. Barrows, New York.

1,208,047. Telegraph-Transmitter. To Charles G. Taylor, Los Angeles, Cal.

1,208,096. Sounder. To Frederick W. Cole, Newton Highlands, Mass.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on December 16:

American Tel. and Tel Co.	125⅛
Mackay Companies (ex-div.)	81½-85½
Mackay Companies, pfd. (ex-div.)	65-66⅜
Marconi Wireless Tel. Co. of Am. (Par value 5.00)	3
Western Union	97

PERSONAL.

Mr. Walter P. Phillips, of Bridgeport, Conn., one of the most eminent old time telegraphers, spent Christmas with friends in New York.

Dr. W. D. Gentry of Chicago, a forty-niner of the telegraph, is now in England on an evangelical mission. He expects to return to the United States early in the New Year.

Mr. F. J. Lepreau, western sales manager of Thomas A. Edison, Inc., primary battery division, has been appointed general sales manager with headquarters at Bloomfield, N. J.

Mr. Walter E. Newcome, manager of the Western Union Telegraph Company's repeater office at Ashland, Ore., was recently elected Illustrious Potentate of Hillah Temple of the Mystic Shrine at that place. Ashland has the distinction of being the smallest city in the world having a temple of the Mystic Shrine, although not the smallest in membership.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Death of G. H. Usher.

George H. Usher, aged fifty-eight years, general superintendent of the Southern Division of this company, with headquarters at Atlanta, Ga., died in that city December 26.

Mr. Usher was born at Fort Edward, N. Y., February 15, 1858, and learned telegraphy at Clifton Park, N. Y. In 1874 he went to Albany, N. Y., for the Atlantic and Pacific Telegraph Company as an operator, and later became chief operator for the same company at Buffalo. He successively filled these positions: Repeater chief for the Western Union at Buffalo, N. Y.; night manager for the Mutual Union Telegraph Company and manager for the Baltimore and Ohio Telegraph Company and in 1889 came to New York to take the managership of the Postal Telegraph Company at 187 Broadway. Later he became assistant superintendent, and afterward assistant general manager, and in May, 1907, was appointed general superintendent of the Southern Division at Atlanta, Ga., which position he held up to the time of his death.

Mr. Usher was a capable official and ranked high in the councils of the Postal Company.

Mr. Gordon Sprong, of the Cleveland staff, has been appointed manager at Akron, Ohio.

Magnetic Club.—The annual meeting of the Magnetic Club will be held at 253 Broadway, January 11.

Mackay Self-Improvement Club.—The following officers have been elected to serve in the Mackay Self-Improvement Club, an association composed of employes at Chicago: T. N. Powers, president; J. Nering, vice-president; L. Goldstein, secretary-treasurer; W. J. O'Brien and E. A. Newman, programme committee.

Mackay Stock Favored by Employes.—It is gratifying to learn that employes of the company are all of the time increasing their holdings in stock of the Mackay Companies. The preference seems to be for Mackay preferred, which is regarded as good as government bonds.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Mr. Lewis McKisick, assistant to the president, passed the holidays at Miami, Fla., where his family is sojourning.

Mr. William E. Lennon, former chief clerk in the office of the secretary of this company, has been appointed assistant secretary. Mr. Lennon was born in Brooklyn, N. Y., December 16, 1876, and has had a wide experience in accountancy and is thoroughly familiar with the duties of his new position.

Mr. F. E. Brown, commercial agent in New York, has been appointed manager of the Central Cable office, 16 Broad Street.

Mr. E. Boening, former district commercial superintendent at Seattle, Wash., has been appointed district commercial superintendent of the fifth district, Western Division, with headquarters at Detroit, Mich., vice Mr. H. J. Kinnucan, retired, effective January 1.

Mr. M. B. Wyrick, division plant superintendent, Chicago, and Mr. Joseph G. Hilbert, division plant superintendent, Dallas, Tex., were in New York on business connected with the service on December 18, 19 and 20.

T. D. Nevins and E. R. Riddle, at Dallas, Tex., have been made division traffic engineer and division traffic supervisor, respectively. These are changes of title.

Mr. E. R. Collins was recently transferred from the managership at Rochester, N. Y., to the same position at Pittsburgh, Pa. The fact that six young managers had prepared themselves for promotion enabled Superintendent A. Woodle, at Buffalo, to move all six up to more responsible positions and to transfer Mr. W. J. Madden from Lockport to take Mr. Collins' place at Rochester. The managers who secured promotion were J. M. Custer, Bert Fake, J. M. Scannell, R. T. Heath, W. D. Shedd and F. P. Bernard.

Mr. L. L. Leith, former manager at Pittsburgh, Pa., has been appointed district commercial manager, with headquarters at the same point.

Mr. E. A. Baird, formerly manager at Pittsburgh, Pa., and who recently returned from furlough, has been appointed manager at Syracuse, N. Y., succeeding E. Altemus, acting manager. In accepting the management of the Syracuse office, Mr. Baird returns to his native state, where he is welcomed by a host of friends, both in and out of the service.

Mr. C. S. Ralston, in charge of premium handling at Pittsburgh, Pa., has been appointed chief operator at Bluefield, W. Va.

Mr. Von M. Summers, manager of the Western Union office at Charlottesville, Va., has been transferred as manager at Covington, Va.

Changes in Western Division.—The following changes in the Western Division, effective January 1, are announced by Mr. C. H. Gaunt, general manager, Chicago: First district, Chicago City, H. Brown, district commercial superintendent, headquarters Chicago; second district, same as present (State of Missouri), A. C. Cronkhite, district commercial superintendent, headquarters St. Louis; third district, Iowa and Wisconsin, A. R. McGrath, district commercial superintendent, headquarters Chicago; fourth district, Minnesota, North Dakota and South Dakota, A. D. Bradley, district commercial superintendent, headquarters Minneapolis; fifth district, same as present (State of Michigan), E. Boening, district commercial superintendent, headquarters Detroit, Mich.; sixth district, Illinois and Indiana, J. C. Nelson, district commercial superintendent, headquarters Chicago.

Cardinal Gibbons of Baltimore, Md., on December 16 filed one hundred and twenty thousand messages with the Western Union Telegraph Company at Baltimore, asking the recipients for a dollar contribution for the benefit of St. Mary's Hospital. Manager V. J. Albert of the Baltimore office was equal to the task and succeeded in delivering one hundred and five thousand of the messages locally without any appreciable delay. Fifteen thousand of the messages were forwarded by wire to points outside of Baltimore.

New Independent Offices have been opened at Willoughby, Ohio, with R. C. Talley as manager, and at Clyde, Ohio, with Cecil W. Goul, manager.

Coat of Gold on Statue of "Electricity."—The statue of "Electricity" which surmounts the tower of the Fulton Street wing of the Telephone and Telegraph Building, at 195 Broadway, New York, has been entirely enclosed in a box. This covering is not intended to protect the undraped figure from the wintry blasts, but to prevent the gold leaf with which the figure is being clothed from blowing away. The statue was described and illustrated in our August 16, 1915, issue.

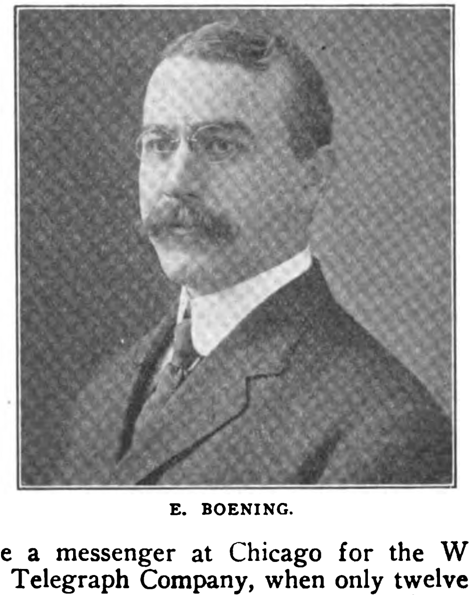
Suggested Forms for Telegrams.—The commercial department of this company has issued a booklet giving suggested forms for telegraph messages appropriate to New Year's Day, Easter, Thanksgiving Day, Christmas, birth days, weddings and births of children, and messages of condolence and congratulatory messages to school or college graduates and public men. It has also issued a leaflet of suggested forms for holiday messages to salesmen, agents, managers, etc., from their employers.

The Punch.—The Christmas number of ***The Punch,*** published in Dallas, Tex., in the interests of the Gulf Division, contains many interesting and helpful thoughts in business getting. A leaflet presents an address to all messengers by General Manager S. M. English, and gives them many valuable suggestions and good advice. In a general address Mr. English says: "We, the overhead expense, join in wishing all of you producers and sellers of service a very Merry Christmas and continued good health, happiness and prosperity for the years ahead."

The American District Telegraph Company of New Jersey, on December 30, made a single special payment to its employes receiving a compensation of $2,000 or less per annum in recognition of the exceptional living conditions now prevailing. Employes receiving less than $1,200 per annum received seven per cent. of their annual wage, and those receiving from $1,200 to $2,000, six per cent.

E. Boening, District Commercial Superintendent, Detroit, Mich.

Mr. Edward Boening who has just been appointed district commercial superintendent at Detroit, Mich., although a comparatively young man, has attained prominent positions in the telegraph service by reason of perseverance and hard work. He was born at Rolla, Mo., November 28, 1874, and became a messenger at Chicago for the Western Union Telegraph Company, when only twelve years of age. From that branch of the service, he advanced to the delivery and bookkeeping departments and in 1899 was attached to the office of Superintendent F. H. Tubbs at Chicago.



E. BOENING.

On March 1, 1903, he was appointed chief clerk in the office of Superintendent C. F. Ames at Boston; March 1, 1905, he became an inspector of the company and on December 1, 1906, was advanced to the assistant superintendency at Boston. On August 1, 1909, he was transferred to the Pacific Coast as assistant to the general superintendent at San Francisco, and in August, 1910, was made district commercial superintendent at Seattle, Wash., from which point he is now transferred to Detroit.

THE CABLE.

Hugh Osborne, aged sixty-seven years, one of the five operators who came to New York from the British post office telegraph to operate the Direct United States Cable in 1874, died at Harwich, Mass., December 13. In 1879 Mr. Osborne joined the French Cable Company's staff, since which he had been prominently identified with that service, most of the time in the capacity of superintendent of the Orleans, Mass., cable station.

Mr. George S. Hall is acting superintendent of the French Cable Company's station at Orleans, Mass., vice Hugh Osborne deceased.

Commercial Pacific Cable Station at Guam.

The Postal Telegraph for December, 1916, prints an interesting account of the Guam station of the Commercial Pacific Cable Company. The Commercial Pacific Cable Company established one of its transpacific cable stations at that place and since doing so in 1903, Guam has become a very important cable center. Cables diverge from Guam westward to the Philippine Islands and China; northward to Japan, and southward to the Dutch Indies, etc.

Guam was selected as a landing place for the transpacific cable by the United States government when that government was considering laying a cable across the Pacific. Later when the Commercial Pacific Cable Company decided to lay this cable it followed the desire of the United States government to land the cable at Guam. The approaches to the island revealed enormous depths, in some places over five miles deep, which had to be circumnavigated when the cable was laid.

The company's station is located at Soumaye, about nine miles from the town of Agana, which is the seat of government. It was necessary to cut clearings in the jungle for the company's buildings.

The laying of the cable was completed in the early part of June, 1903, and the entire line from San Francisco to Manila was opened for business July 4, 1903.

The buildings of the company consist of an office building, superintendent's dwelling, staff quarters, mess building, servants' quarters and four bungalows for married men. They are constructed of steel and cement and illuminated with acetylene gas. There are also two windmills, fresh and salt water reservoirs, gas house, boat houses, oil houses, etc., on the property.

In 1904 the company's cable repairing ship "Scotia" was wrecked on the island by grounding on a reef and finally breaking up, becoming a total loss.

The present staff consists of Superintendent P. McKenna, Supervisor H. H. Taylor and operators Fraser, Axelrod, Decoito, Perry, Longobardi, Lewis, Zilbach, P. F. Harrison, A. F. McKenna, Foden, Rolley, Hunter, N. E. Harrison and Smith.

Mr. McKenna has been identified with the Commercial Cable interests since 1892. He was appointed a superintendent in the Commercial Pacific Cable service in 1906 and has served at San Francisco and Guam. His personality, devotion and stant inspiration to those who serve under his di- zealousness in the company's interests are a con- rection.

CANADIAN NOTES.

GREAT NORTH WESTERN.

Mr. G. H. Walters has been appointed traffic supervisor and assigned to the traffic department of the Great North Western Telegraph Company. Mr. Walters was born at Stayner, Ont., October 22, 1883. He learned telegraphy in the Grand Trunk department at Elmvale, Ont., and Holland Centre, Ont., on the Canadian Pacific Railway. In January, 1902, he entered the service of the Great North Western Telegraph Company at Fergus, Ont., and was transferred to the Toronto main office of that company in October, 1904. In May, 1905, he was made assistant night chief operator; in April, 1908, assistant wire chief, and in November, 1910, night chief operator. He was assistant chief operator at Toronto, Ont., from July, 1915, till June, 1916. Recently he acted as a special representative of the traffic department. Mr. Walters has worked his way up mainly through hard and conscientious work and will have a larger field for his energies in the new position.

This company used a special holiday message blank for Christmas greetings delivered Christmas eve and Christmas morning.

Hon. J. K. Kerr, K. C., senator, aged seventy-five years, who was a director of the Great North Western Telegraph Company since 1905, died at Toronto December 4.

Norman W. Bethune, aged eighty-eight years, an eminent scholar and prominent business man of Ottawa, Ont., and a telegrapher for many years, died in that city December 7. Mr. Bethune was born in Montreal, November 19, 1828, and was educated in Montreal. He studied medicine at McGill University, and read one of the lessons at the opening of the celebrated university. On the death of his father, who passed away in 1847, he studied telegraphy and was one of the first Morse operators in America. After a successful study of the system he entered on his business career and took his first position in Montreal. He later worked in Troy and Albany, N. Y., where he gained wide experience, being himself a most efficient operator. He was for a time manager of the old Montreal Telegraph Company. In Ottawa he assumed the duties of manager of the Great North Western Telegraph Company, which position he filled until his superannuation October 1, 1904. Many skilful and now prominent men have served under him. Being a man of strong intellect himself, others found in him a model. Thomas Ahearn, Warren Y. Soper and many other men now prominent in the financial world were trained under him. The death of Mr. Bethune is deeply regretted, not only in Ottawa, but in Montreal and the United States, where he was well known. He is survived by his wife and one son, Mr. Kenneth Bethune.

Mrs. W. J. Duckworth, wife of the plant superintendent of the Great North Western Telegraph Company, died at her home in Toronto, Ont., after an illness of about three months. Mrs. Duckworth was born in St. Mary's, Ont., but had lived in Toronto for the past thirty-five years. She is survived by her husband, one son, William, at home, and one daughter, Mrs. Ralph B. Hornibrook, also of Toronto.

JAMES HEDLEY, aged seventy-six years, a pioneer telegrapher of Canada, died in Toronto, December 24. He was editor of *The Monetary Times* from 1877 to 1906.

MR. ARTHUR J. MACK, a native of Pennsylvania, a well-known telegraph operator on the Pacific Coast, who at the breaking out of the present war, enlisted in Canada in the Canadian Signal Corps Contingent is having a remarkable career. He has been on the battle front as wireless operator ever since the war started. He seems to bear a charmed life and has seen his comrades mowed down around him, while he still fights on. He has undergone a fever, spent four months in a hospital and now is finally wounded and at that was able to walk away while his companion operator was killed.

SPECIAL CHRISTMAS TELEGRAPH BLANKS.—The Canadian Pacific Railway Company's telegraph used a special and unique telegraph blank and envelope on Christmas day. The blank was headed with the Union Jack, and the flags of all the allied nations in the war, printed in colors. The company's insignia was also shown in colors. The envelope had printed on it the words "Season's Greetings Telegram."

Mr. J. McMillan, manager, and Mr. W. J. Camp, assistant manager, Canadian Pacific Railway Company's Telegraph, Montreal, Que., in renewing their subscriptions to this publication for the year 1917, write: "The AGE is a welcome visitor and we look forward with pleasure to the receipt of each issue."

THE TELEPHONE

DIVIDEND.—The American Telephone and Telegraph Company will pay a dividend of $2 per share on Monday, January 15.

BELL REVENUES.—The operating revenues of the Bell system in the United States for the ten months ending October 31, were $217,531,853 and the total operating expenses $143,872,217. The operating income was $60,239,142.

CONFERENCE CALLED BY TELEPHONE.—The Chicago Telephone Company and its subsidiary companies on December 7 called 528 persons in the city, notifying them of a meeting of the Central States Conference on Rail and Water Transportation, which was held in Evansville, Ind., December 14 and 15. The same message was sent to 238 other cities. Mr. N. C. Kingsbury, vice-president of the American Telephone and Telegraph Company, was one of the speakers at the conference.

GOOD AND EVIL OF THE TELEPHONE.—"This telephone is the greatest nuisance that ever was invented," said a merchant to a customer. "Then why do you not discontinue the service," said the customer. "I can't do that," said the merchant, "because it is equally as great a convenience as it is a nuisance and if I discontinued the service I would have to go out of business."

TELEGRAPHERS ENTER TELEPHONE SERVICE.—The following well known telegraph operators have been added to the American Telephone and Telegraph Company's staff in the Birmingham, Ala., district: G. S. Mathews and Levie A. Jackson from the Western Union, Birmingham; William H. Hill from the Frisco Railway at Jasper, Ala.; George Buckingham from the Atlanta, Ga., office; Earle E. Esco from the Union Pacific Railway, Denver, Col.; John Garrison from the Alabama Great Southern Railway, Epes, Ala.; W. C. Causey from the Meridian Terminal, Meridian, Miss.; and Fred. G. Gardner from the New York Central, Buffalo, N. Y.

Generosity of Bell System Towards Its Employes.

Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company, has announced that more than $6,000,000 will be distributed by the Bell Telephone System among its employes to help meet the increased cost of living.

Details as to the time and method of distribution will be arranged by the several companies constituting the Bell system as, in the judgment of the local management, may be for the best interests of the employes. However, it has been decided that the equivalent of three weeks' pay will be given to those receiving $3,000 or less per year, who have been in the employ of the company a year or more; the equivalent of two weeks' pay to those receiving $3,000 or less, who have been in the employ of the company less than a year but more than three months, and bonuses not yet fixed to those receiving more than $3,000 but less than $5,000 a year.

Mr. Vail made it clear that the payments were not a distribution of profits and that all employes would not participate, the design being to assist those most in need of aid.

Telephone Engineers' Conference Banquet.

Engineers of the American Telephone and Telegraph Company held their annual "Conference Banquet" at the Hotel Astor, New York, Saturday, December 16. About 400 men were present and practically all parts of the country were represented. Mr. J. J. Carty, chief engineer of the company, presided in the absence of President Theo. N. Vail, who was unable to attend because of a cold.

Mr. Vail sent a letter of greetings which was read by Mr. U. N. Bethell, senior vice-president.

Among those who spoke of the present and future of their craft were: U. N. Bethell, F. H. Bethell, E. F. Sherwood, N. T. Guernsey, the general counsel; H. B. Thayer, president of the Western Electric Company; Bancroft Gherardi, K. W. Watterson, F. B. Jewett and W. R. McGovern.

Among others present from New York were E. H. Colpitts; F. A. Pickernell, James Robb, R. S. Scarburgh, J. L. Swayze, Gerard Swope, H. E. Shreeve, F. P. Valentine, H. F. Thurber, F. A. Stevenson, T. D. Lockwood, C. E. Scribner, G. D. Milne and H. W. Casler.

Government Ownership of Telephones.

Representative David J. Lewis of Maryland has introduced a bill in Congress providing for the telephone system of Washington to be taken over by the Post Office Department and operated as an experiment.

"The idea is," he said, "that at the seat of government, where its most important executive, military and other correspondence take place, the government should be in complete control of its communicating system."

The bill provides that at first a tariff of $12 per annum, including 600 calls, and two cents for each individual call be charged.

I am the Telephone.

"I am the man of business. Without me nations would decay, and their vast enterprises would be seriously handicapped. I am worth millions, and I have in my service a multitude of slaves, who bow down at my every beck and nod. Sometimes men curse me, but more often they bless. I have been watered with a mother's tears, and tended with the care given a new-born infant. I carry the news of your coming into the world, and the tidings of your going hence, and to me they are all the same. I share my honors with no one, save it be my cousin, the telegraph, and then only slightly. Into my listening ear the sorrows and joys of the whole wide world are poured, and into the very heart of the melting pot of life my wires run. I serve you well and faithfully, and my pay is a pittance—I am the telephone."—Hannibal, Mo., *Morning Journal.*

THE ASSOCIATED PRESS.

Mr. Melville E. Stone, general manager, Associated Press, New York, was one of the speakers at the dinner given at the Lotos Club, New York, December 21, in honor of Charles M. Schwab, chairman of the board of directors of the Bethlehem Steel Company.

The board of directors of the Associated Press has authorized the creation of a committee of five to organize a system of sick relief benefits, the entire expense to be borne by the Associated Press. Three members of the committee are to be selected by the members of the traffic department, the traffic manager and the treasurer, also to serve upon the committee.

A Curious Fact.—A piece of wood cut from a tree is a good conductor; let it be heated and dried, it becomes an insulator; let it be baked to charcoal, it becomes a good conductor again; burn it to ashes, and it becomes once more an insulator.

RADIO TELEGRAPHY.

MARCONI NOTES.

The Marconi Company has inaugurated a commercial department, and Mr. David Sarnoff, former assistant traffic manager, has been appointed commercial manager, with headquarters at New York City.

Mr. G. Harold Porter has been appointed assistant commercial manager.

Mr. Lee Lemon, former superintendent of the Trans-oceanic Division of this company, has been appointed purchasing agent.

Mr. Charles J. Ross, former auditor, has been appointed comptroller of the Marconi Wireless Telegraph Company of America. As his lieutenants, Mr. H. A. Sullivan, former chief clerk, has been appointed auditor of disbursements, and Mr. Henry Heisel, former traffic auditor, has been appointed auditor of receipts. On November 23, 1916, Mr. Ross was elected vice-president of The Wireless Press, Incorporated, of which company Edward J. Nally is president.

Mr. E. B. Pillsbury, general superintendent, Trans-oceanic Division of the Marconi Wireless Telegraph Company of America, returned to New York December 20, after a four months' trip through the Pacific Coast Division. During his absence he visited Alaska, Hawaii and California.

Mr. George S. DeSousa, traffic manager, Marconi Wireless Telegraph Company of America, returned to New York December 20, after an extended trip throughout the west. During his trip he reorganized the Pacific Coast Division of the Marconi Company and had full charge of the opening of the new Marconi wireless service between California, Hawaii and Japan.

No Antenna Needed.—Dr. E. J. Berg, professor of electricity at Union College, Schenectady, N. Y., has discovered that by wrapping coils of wire about a certain kind of hollow frame wireless waves can be picked up without the use of antennae.

Automobile Hoist in Wireless Work.—Workmen on the masts of the Marconi station at Bolinas, Cal., are raised aloft by means of tackle connected to a Maxwell touring car, the car engine supplying the hoisting power.

Wireless News on Board of Steamers.—The *New York Herald* has arranged with the Marconi Wireless Telegraph Company of America for the distribution of a news service by wireless from the high-power station at South Wellfleet, Mass. Bulletins containing the latest news are now published daily on board of passenger steamers at sea.

Navy Radio Stations.—According to the report of the Secretary of the Navy, the Navy Department has fifty-one radio stations in operation ashore and on light vessels, two of which are high-power stations, ten of medium power, and the rest of lower power for communication with ships. During the next year at least two new high-power stations will be completed, namely, at San Diego, Cal., and at Pearl Harbor, Hawaii.

RADIO TELEPHONY.—Dr. Alfred N. Goldsmith, director of the Radio Telegraphic and Telephonic Laboratory of the College of the City of New York, is the author of an illustrated article on radio telephony which appears in the January number of *The Wireless Age*. The broad problems involved in radio telephony are fully discussed. This article is the first of a series of twelve which will appear in *The Wireless Age*.

Long Distance Wireless Record.

A new world's wireless record for long distance work has been established on the 600-meter wave length. The steamer "Floridian" left San Francisco for Sydney, Australia, July 13. From that date up to and including July 31 the vessel's position was transmitted to San Francisco. The position reports, with one exception, were received directly at the Marconi Hillcrest station, San Francisco, up to a distance of 5,227 miles.

The "Floridian" is equipped with the standard Marconi two-kilowatt, 500-cycle panel set. The current consumption at the transformer did not exceed 1,600 watts up to 2,600 miles, and at 5,200 miles the power consumed was 2,600 watts. San Francisco's signals were audible up to some 3,000 miles.

C. J. Ross, Comptroller, Marconi Wireless Telegraph Company of America.

Mr. Charles J. Ross, who has just been appointed Comptroller of the Marconi Wireless Telegraph Company of America, New York, was in his early career employed as a messenger in the office of the Postal Telegraph-Cable Company at Cleveland, Ohio.

Mr. Ross was born in Brighton, Ohio, and began his experience as a wage earner at the age of sixteen years. He advanced from being a messenger through the commercial side of the business. He left the Postal Company and joined the Cleveland Telephone Company as a line inspector, eventually becoming manager of the main exchange. While in that position he made many improvements in methods of keeping close tally on the movement of business.

He came to New York in 1901 and was auditor and accountant in large commercial houses and was engaged by the Marconi Company April 1, 1915, to systematize the entire business of the company throughout the United States, Alaska and Hawaii. He has done a great deal of work as a public accountant and has systematized more than 100 prominent corporations.

David Sarnoff, Commercial Manager, Marconi Wireless Telegraph Company of America.

Mr. David Sarnoff, who has just been appointed manager of the commercial department of the Marconi Wireless Telegraph Company of America, New York, is one of the most able young men engaged in the wireless telegraph business. While he is also a land line operator his experience has been almost entirely in the wireless field. He spent some time as operator and manager at the Siasconset, Mass., and Sea Gate, L. I., wireless stations of the Marconi company, and was afterward assigned to ship duty. He was sent to the Arctic ice fields to equip vessels and operate the Marconi system on a seal fishing expedition.

Mr. Sarnoff studied electrical engineering evenings at the Pratt Institute, Brooklyn, and after his graduation was appointed chief inspector of the Marconi company in New York. He became successively assistant to the chief engineer, assistant traffic manager and contract manager, and now has been advanced to the managership of the commercial department.

Mr. Sarnoff has done a great deal of technical work in the advancement of wireless, and contributed many papers and articles on the subject before scientific bodies and in the technical press. He installed the wireless system on the Lackawanna Railroad, and is an active member of the Association of Railway Telegraph Superintendents. He is also secretary of the Institute of Radio Engineers, and while an enthusiastic wireless man he is safely conservative in his utterances as to the future of radio telegraphy.

Amending Radio Laws.

The administration's bill to strengthen government control of radio communication and amending laws on that subject was introduced in the House December 19.

"The bill is based on that passed in 1912, but experience gained since then," said Representative Alexander, who introduced the bill, "has shown the necessity of strengthening some of its provisions. The principal changes involved are the following:

"1. All government stations, mainly naval stations not reserved for government business exclusively, may be opened to commercial business.

"2. The bill enables the government to purchase such commercial coast stations communicating with ships at sea as the companies operating them are willing to sell at a fair valuation. The purpose is ultimately to establish the complete and exclusive govermnment system of commercial radio communications between the coast of the United States and outlying possessions and ships at sea. The need of such government ownership and operation in time of war has been shown by the events of the past two years, but there is strong need for relief from the mutual interference between stations, with resulting reduction in the amount of business that can be handled by radio telegraphy in a given area.

"3. It provides that not to exceed one-third of the stock of corporations operating stations in the United States may be owned by aliens, and not more than one-third of the directors may be aliens.

"4. All licensed operators hereafter except those serving on board ship must be American citizens."

"The bill just reported from the Committee on Merchant Marine and Fisheries, by Chairman Alexander, for the greater government control of wireless stations, is objectionable on many grounds," said Mr. Edward J. Nally, vice-president and general manager of the Marconi Wireless Telegraph Company of America. "Government control will tend to hamper the art of radio communication, for the government has not the stimulus of commercial competition and the hope of individual reward, and it is prone to take present accomplishments as finalities.

"There is no danger of alien control—the Marconi Wireless Telegraph Company has offered to place at the disposal of the nation in time of war, not only all its operators, but the equipment of the company and the services of the entire staff. The government itself could do no more. Of the stockholders on the books, 27,000 are American citizens, and the whole company is thoroughly American.

"Finally, if the government takes over the operation of the nation's radio service, it is only a step to Federal operation of the telephone and telegraph systems of the country. Here lies the importance of the radio bill—it is the entering wedge of government ownership in America."

Answers to Questions.

Q.—Can you tell me how the increase of water development for public service use, especially in the West, during the past few years compares with the increase in steam power? S. K. D.

A.—According to a recent report of the Forest Service, U. S. Department of Agriculture, the rate of increase in water power development for public service use from 1902-1912 was approximately three times as great as in steam power. Primary power installation from all sources and for all uses increased from 1902 to 1912 more than two and one-half times as rapidly in the eleven western states as in the remainder of the United States, while the increase for primary electric power for the same period was 440 per cent. for the western states, as against 226 per cent. in the other states. The development per capita of the western states in 1912 was two and one-half times as great as in other parts of the country.

Q.—Will you please tell me what "Bakelite" is? I have seen it mentioned frequently as an insulator, but I have never seen a description of the material. M. A.

A.—Bakelite is a trade name for a synthetic product developed by Dr. L. H. Baekeland, a well-known chemist. In its pure form it is a transparent, amber-like substance of marked chemical inertness. Physically, it is heat-resisting, mechanically strong, a high dielectric, impervious to most acids, steam and oils, and cannot be dissolved by any known solvents. It is the product of carbolic acid and formaldehyde so united as to produce a substance with entirely new chemical and physical characteristics, compared with either of the elemental substances. The chemical name for Bakelite is oxy-benzyl-methylen-glycol-anhydride.

Q.—The Vail family, past and present, seems to be and have been prominently identified with telegraph development. Is there any relationship between Mr. Theo. N. Vail, former president of the Western Union Company, and Alfred Vail, who was a partner of Professor Morse in the development of the telegraph? J. M. C.

A.—Yes; Alfred Vail was an uncle of Mr. Theo. N. Vail.

Experimental Electricity and Wireless Courses.

The Experimenter Publishing Company, New York, has issued in book form an experimental electricity course, by S. Gernsbeck and H. W. Secor. There are twenty lessons in the course, covering these subjects: Electric bells, buzzers and annunciators, primary batteries and dry cells, storage batteries; rectifiers and transformers; small electric lighting plants; electrical wires and their calculations; telegraphs and telephones; generators and motors; switches; burglar alarms and miscellaneous connections; experimental electro-physics; electro-therapeutics; induction coils and Geissler tubes; the X-ray; high frequency currents; electroplating; static electricity and static generators; electrical measuring instruments; practical mathematics; how ot make things. It will be seen from this list that the work is intensely practical, and no doubt will be heartily received by practical men and experimenters. The book is profusely illustrated with views of standard apparatus, and many diagrams of connections are given.

The same authors, together with Mr. A. Lescarboura, have also brought out in one volume a wireless course in twenty lessons, along the same lines as the Experimental Electrical Course. Practical wireless operation is well covered, the wireless telephone, mathematics of wireless telegraphy and a history of wireless developments being the concluding lessons. This work is well illustrated and contains a great deal of valuable information on the general subject of wireless. It is not claimed that the book is more than an elementary treatise. Its object is to give the student a general idea and better understanding of wireless telegraphy, and in this we think it will answer its purpose very well.

The price of each of these books is $1.00, and copies may be obtained from TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

New Book on Telegraphy.

The third edition of "Telegraphy," by T. E. Herbert, of London, has just been issued. This work is a detailed exposition of the telegraph system of the British Post Office, and has been thoroughly revised and enlarged, containing now 985 pages and 630 illustrations.

This is a valuable book for the American telegraph engineer, because it not only describes the English telegraph systems but other systems which are of direct interest to American practice. The treatment of the various subjects is carried out in a masterly style, and, altogether, the book forms a valuable work of reference, and for study as well.

The terminology in many instances sounds peculiar because it is English, but it is self-suggestive, so there need be no difficulty in understanding the meaning of the terms. "Forked repeater," and "Forking wires," for instance, cannot be taken for anything else other than branch repeater and branching wires.

The price of this book is $4.00 and copies may be obtained of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

Marconi Men on the Wing.

BY E. B. PILLSBURY, GENERAL SUPERINTENDENT, MARCONI WIRELESS TELEGRAPH COMPANY OF AMERICA, NEW YORK.

It's a long, long way from Manhattan to Vancouver, over the majestic Canadian Rockies, across eight states and four provinces; and a far cry thence to Alaska, where Mr. W. A. Winterbottom and the writer reached our farthest north, and on to Hawaii, our farthest south, and back home through California over the Union Pacific. It takes but a moment to outline the route, but many weary miles to traverse it. We have encountered a variety of climates and divers kinds of people, as well as glaciers, icebergs, dog teams, active volcanoes, strange fishes and birds, tropical flora, bewildering hula-hulas, unknown fruits, surf boards, and everywhere boundless hospitality. During five voyages on the much dreaded Pacific, old Neptune was as placid as is Long Island Sound and two of these voyages were made on the "Great Northern," one of the floating palaces of the Pacific, unequaled for speed on the Atlantic and surpassing any ship of her size in American waters for luxurious fittings and perfect service. Messrs. Bryant and Wiese, the Marconi officers on board, made us feel right at home, and the same is true of every ship on which we sailed.

We left New York near the end of August, crossed the continent in sizzling weather without discomfort, and embarked at Vancouver on the Grand Trunk liner "Prince George" for Juneau, where we landed after a grand trip through the inside passage, which resembles a continuous performance on the lower half of the Hudson River. The captain went out of his course to allow the passengers a close view of the great Taku glacier at sunset.

We found Juneau to be a modern city of 7,000, built mainly on piles, paved with timber, the buildings modern, many being of concrete construction. One of the office buildings is of seven stories, equipped with an electric elevator in charge of a colored conductor wearing spotless white gloves. The streets are electrically lighted and alive with motor cars. The mountains extend right down to tidewater, leaving but a narrow level stretch. The hotels would do credit to any moderate sized city, although the cost of food is abnormal. We found it warmer in Juneau than in Vancouver and did not wear overcoats during September. There were flowers everywhere, sweet peas being in many cases as high as twelve feet. Vegetables grow to unusual size. We were told that in mid-summer it is at times too warm to work during the middle of the day owing to the in-shore sweep of the Japan current.

Manager Bence at Juneau is an able official and is in charge of the erection of our new station building and steel tower, the latter being far up on the mountain side. He has an interesting family and an efficient staff, consisting of Messrs. Manahan, Marthaler and Schneider, the two last named "batching" it on the mountain top. They invited us to remain for luncheon and prepared an excellent meal of ham and eggs with accessories, although in turning the eggs Marthaler landed one of them on the floor.

Before leaving we called on the Governor, who received us with much cordiality. On the lawn in front of the capitol is an old cannon of Russian vintage.

We had an opportunity to go through a quartz mill and observe the process of separating gold from the rock, this particular mill yielding $1,000 per day in pure gold, the work being almost entirely automatic, the workmen merely watching the machinery.

We also were privileged to inspect a salmon cannery where the work is done mainly by machinery, and we are through eating canned salmon forever! We saw in one of the streams, large salmon jumping over falls seven feet high to reach their spawning grounds. After spawning they die, if not captured by means of seines.

The indian villages are interesting, being built in imitation of the white man's and the indian burial places are unique, being ornamented with curiously shaped and carved images of birds and fishes, and totem poles to represent families and tribes, some being fifty feet high. Some tribes enclose the corpse in a bag and hang it in a tree out of the reach of animals. We saw one so placed at Alert Bay. The indians live by hunting, fishing, farming, making baskets and moccasins.

Ketchikan we found to be a town very similar to Juneau but considerably smaller, the shops in both towns being attractive to tourists. Manager Powell and his charming wife and infant daughter were most hospitable and we found his efficient staff to consist of Messrs. Lange, Svenson, Johnson and Wilhelm, all good men and true. The wireless station is so located as to be accessible only by water in the winter season and a good sized motor boat is a part of the equipment.

Wrangell resembles Ketchikan and is devoted solely to fishing. It has the most remarkable collection of totem poles in the territory.

We enjoyed a week-end trip to Skagway and over a narrow gauge railway through the famous White Pass to White Horse on the Yukon, and found the mountain scenery magnificent. At the divide on the Canadian frontier is a tablet marking the latitude and longitude, and close by two flagstaffs on which British and American flags are always flying. At White Horse the mimimum unit of currency is the 25-cent piece, and in consequence tipping is unknown, as the natives regard two bits as we regard a nickel. A pleasant hour was spent with Chief Operator Watson in the Dominion government telegraph office, where we observed the working of a circuit between Dawson and Vancouver through five repeaters, roughly 1,700 miles, the line consisting of a solitary iron wire running mostly over mountains and through unbroken forests, where highways are unknown.

Coming down the coast on the fine ship "Princess Alice" of the Canadian Pacific line, we rejoined our luggage at Vancouver and after "slicking up" proceeded across Puget Sound to Seattle, stopping at

Victoria for a couple of hours, where we took a rubber-neck ride. We were shown the Y. M. C. A. building which is closed on account of so many members joining the colors, and were told that it is filled with unclaimed personal effects sent there for storage by boys who will never return. At Vancouver we attended church and found it filled with women, with a sprinkling of old men and crippled soldiers.

The Seattle station is finely housed in the only sky-scraper in town adjoining the offices of the marine superintendent. The excellent staff comprises Messrs. Christianson, Cowden, Wilson and Buchanan, and traffic is handled to the queen's taste.

Going on to Astoria we found the station located on a small inlet from Columbia River in the outskirts of the city, in charge of Manager Julien and his enthusiastic staff, comprising Messrs. Roy, DeChamplain and Hamilton. All traffic with Alaska is relayed here and we found Mr. and Mrs. Julien and their two fine children hospitable to the last degree. The marine station is located on a neighboring hill. Mr. A. M. Greenwell is manager, assisted by Messrs. Baxter, Obriadvic and Ticknor.

The "Great Northern" brought us quickly around to San Francisco, where we made a close connection with the good ship "Matsonia," to which we became warmly attached. In six days we sighted the fascinating Diamond Head and received a hearty welcome to Honolulu, which proved to be attractive beyond our expectations. This climate is agreeable, the heat being tempered by constant trade winds and frequent brief sun showers, and the streets well shaded by fine old tropical trees. The houses are mostly of the wooden bungalow type and the buildings in the business section mainly concrete. The broad streets are well paved, the trolley service admirable and traffic is ably controlled by uniformed traffic officers, mostly natives. The automatic telephone service, the schools, fire department, postal service, etc., are thoroughly up-to-date. A local wireless system provides good communication between the principal islands of the group and also with Samoa and Tahiti. The hotels equal the high grade hotels on the continent, both in quality and prices. Automobiles are everywhere in evidence. Any one who fails to take a dip at least once a day at Waikiki Beach is the exception. The warm water, fine beach with exhilarating combers, outrigger canoes and surf boards, combine to make it an alluring resort. Swimming is almost universal with both sexes, even the youngsters of six taking to it like young ducks.

The Secretary of the Territory secured us an audience with the Governor, whom we found most cordial and deeply interested in the success of Marconi and particularly in the approaching inauguration of the Japanese service, in which we invited him to participate. We were shown through the capitol, which was formerly the Queen's palace, the handsome throne room remaining undisturbed.

At the city office we found Manager Hawk, ably assisted by operators Carlisle and Walsh with a clerk and three Chinese messengers. Messages are transmitted direct to the coast. We were handsomely entertained by Mrs. Hawk and her two attractive daughters.

We went by automobile to Kahuku, fifty-two miles north over very good roads and through fine mountain scenery. This is the transmitting station, in charge of Engineer Rau. His staff comprises Messrs. Stepp, Eklund, Graff, Harvey, engineers, and Messrs. Gompf, supervisor of traffic, and Anderson, Moe Allen and Lynch, operators; Hackenburg, mechanician; Raymond, chief rigger, and a corps of firemen, oilers and riggers. During busy hours the transmission is by Wheatstone automatic. The staff has formed the Marconi Social Club for promoting entertainment, buying records, magazines, etc. The company has provided a player piano, phonograph, billiard table, tennis courts, traveling rings, etc., and swimming parties are daily affairs, a fine beach being directly in front of the buildings. Mrs. Rau is the charming chatelaine of the station.

Koko Head ,the receiving station, is twelve miles west from the city, reached by automobile. Although completed, the station is not yet in commission, being held in reserve until duplex operation is required when both sending and receiving operators will be stationed here, the two stations being joined by overhead wires.

The Japanese service was inaugurated during our visit and aroused the keenest interest in the city.

It was our privilege to act as hosts in entertaining as the guest of the company the eminent Japanese radio engineer and author, Mr. Eitaro Yokoyama, of the Ministry of Communications, Tokyo, who is traveling around the world in the interests of his department. He was a charming guest and left many souvenirs of Japan among the staff.

Advantage was taken of an opportunity to pay a week-end visit to Kilauea, the largest active volcano in the world, near Hilo, and it was certainly an awe-inspiring sight. The crater is a depression of considerable extent 300 feet below the surface, composed of dull colored molten lava, traversed in various directions by luminous streams of liquid fire, and dotted with a dozen or more fountains spurting liquid fire fifty or sixty feet into the air from a depth of 60 miles, continually dying out and belching forth in a new place. The whole molten area is rising at the rate of three feet per day and is expected to overflow in the near future.

We sailed away from the islands regretfully on the "Great Northern," loaded to the ears with native floral wreaths, and in moving out from the dock broke innumerable strands of serpentine confetti ribbons plentifully supplied by the stewards, the shore ends being held by our friends, while native swimmers surrounded the ship, diving for coins, and boys of a larger growth dived and jumped from the upper deck for our entertainment. We came across in three and one-half days and were happy to be greeted on landing by Mr. G. S. DeSousa, of New York, traffic manager of the company.

Together we proceeded to Marshall, thirty miles up the coast, where our receiving station is finely located on a bluff with a picturesque bay at its base. Manager Baxter entertained us and introduced us to his staff, comprising Messrs. Barsby, Lange, Mohl, Gilbert, Palmer and Schecklin, operators, who were handling Hawaiian and Japanese traffic as steadily as on a cable.

Going thence to Bolinas, on a point projecting into the ocean twenty-five miles north of the Golden Gate, and reached by a spiral highway across a mountain range, we found our sending station for the trans-Pacific circuit located on a bluff close by the beach, with mountains as a background. Only engineers are stationed here, the sending apparatus being controlled from Marshall by means of land wires. The staff consists of Engineer-in-charge Isbell and Messrs. Campbell, Baker, Forbes, Howard, Bailey, Riddle and Ritter; Chambers, machinist, and Davidson, chief rigger, and a corps of riggers, oilers and firemen. The buildings and grounds are fully completed, presenting a handsome and homelike appearance. A social club, known as the Hermits, is in a flourishing condition. The company has provided a player piano which, with a billiard table and fine tennis courts, help to while away the hours off duty and the result is a happy family, gracefully adorned by Mesdames Isbell, Davidson and Campbell. We visited the marine station at Hill Crest in the outskirts of San Francisco and were rewarded for a stiff climb up the hill by a wonderful view of the city and the Golden Gate. This station communicates with ships far to the westward of Hawaii. The able manager is Mr. R. Johnstone and his operating staff consists of Messrs. Shaw and Jorgenson.

Returning to San Francisco, Mr. W. A. Winterbottom took up his new duties as division superintendent, while Mr. De Sousa and I proceeded homeward, where we arrived somewhat jaded but eager for a reunion with our families and the enjoyment of the Christmas holidays.

The Late Captain Samuel H. Beckwith.

In our December 16 issue, we recorded the death of Samuel H. Beckwith at the Soldiers' Home in Hampton, Va.

Mr. Beckwith was operator for General U. S. Grant during the Civil War and was frequently referred to as "Grant's shadow." He had the full confidence of the great General during the four years of the civil strife and indeed until Grant's death. Beckwith was honored with a commission as captain in the regular army on Grant's recommendation.

He was born at Hamilton, N. Y., December 18, 1837 and for twenty-five years had made his home in Utica, N. Y.

In January, 1915, in failing health, he decided to go to Hampton, Va., and be cared for in the Soldiers' Home at that place and he remained there until his death on December 7, 1916.

Beckwith's military telegraph career began in 1862 when he joined Colonel W. H. L. Wallace's regiment at Villa Ridge on the Illinois Central Railroad near Cairo. The late Ed. Schermerhorn, a private in the same regiment, assisted Beckwith in telegraphing at this field office which was on the Chicago main line. Beckwith remained there for a month when the regiment moved to Bird's Point.

He was in the battles of Fort Donelson and Shiloh, and accompanied his regiment to Corinth and Jackson, Miss. Later he was detailed to assist the operators at General Halleck's headquarters in Corinth.

August 17, 1863, Beckwith sent a letter to Major-General McPherson, together with a pair of major-general's shoulder straps, to be presented to Major-General U. S. Grant as a token of the respect and esteem held toward him by the operators in the field. In this letter Beckwith acknowledged with gratitude the many kindnesses extended to the operators by the General.

In August Beckwith narrowly escaped being killed by the explosion of an ordnance boat at City Point wharf. One of the missiles set fire to his bed clothing while he sat on the opposite side of his tent. Over sixty persons were killed and 130 wounded by this disaster but Beckwith escaped injury.

The day after the fall of Richmond, President Lincoln visited that city, and Beckwith, who was a little behind in General Grant's carriage which was brought up for the President's use, received loud huzzas from the excited populace as the elegant equipage came rolling up to Jefferson Davis' house where the President had preceded him. "Young man," said Mr. Lincoln, with a twinkle in his eye, as Beckwith came up to report: "I am afraid you have been stealing somebody's thunder."

After the assasination of the President, Beckwith rendered valuable services in locating the whereabouts, and assisting in the capture of Booth, the assassin, and for this service, received $500 of the reward offered by the government.

Beckwith was a most expert operator, his exceptionally fast sending being a matter of well remembered history in telegraphic circles and in addition his penmanship was unusually fine and clear as is mentioned in David Homer Bates' "Lincoln in the Telegraph Office," where on page 57 appears a reproduction of one of the pages in Beckwith's war department cipher book.

He has published from time to time most interesting reminiscences of General Grant, notably in the *New York Times*, May 31, 1914, and in a series of articles published in the *Boston Sunday Post* in April, 1913.

When Beckwith left Utica two years ago for his final home in Hampton, Va., he left with his friend, Miss M. D. White, an envelope addressed to his Civil War comrade, David Homer Bates, to be mailed to Mr. Bates with the announcement of Beckwith's death when it occurred.

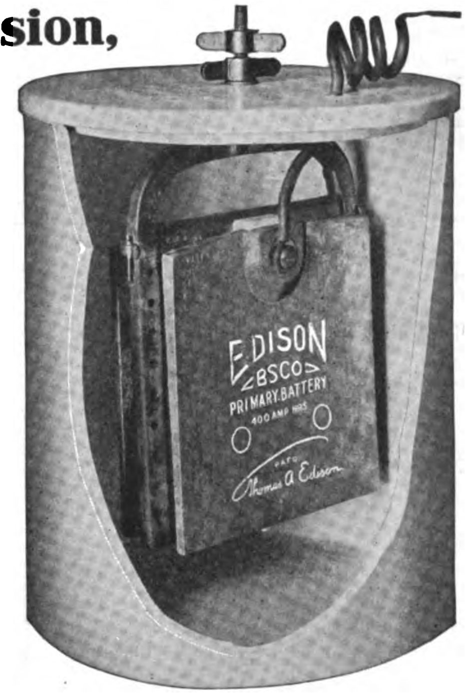
Mr. Bates received this letter a few days after Beckwith died.

Mr. L. Derrick of the Western Union Telegraph Company at Philadelphia, Pa., in remitting to cover his subscription for another year, writes:

" 'Tis nice to be remembered,
And a pleasant thing to find,
When the "AGE" subscription has nearly expired,
To have J. B. T. put you in mind."

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



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THE RAILROAD.

Mr. A. W. Beauprie, of Atlanta, Ga., has been appointed assistant to Mr. J. A. Jones, superintendent of telegraph, Southern Railway, Washington, D. C.

Death of C. M. Lewis.—Charles M. Lewis, aged sixty-nine years, superintendent of telegraph, Philadelphia and Reading Railway, and formerly superintendent of the Philadelphia, Reading and Pottsville Telegraph Company, died in Reading, Pa., December 15, of heart failure. He entered the telegraph service as a messenger at Pottsville fifty-two years ago. Later he became an operator and was appointed manager of the Pottsville office September 1, 1870. On April 1, 1900, he was appointed superintendent of telegraph of the Reading Railroad and occupied that position at the time of his death. Employes of the Philadelphia and Reading Telegraph Company acted as pall bearers.

Railroad School for Operators and Dispatchers.—The Buffalo, Rochester and Pittsburgh Railway will equip a department for the training of telegraph operators and train dispatchers at the Weber Memorial Training School at Punxsutawney, Pa. In this department will be all the equipment to be found in a train dispatcher's office of a modern railroad. Telephone as well as telegraph instruments will be furnished. The instruments used in the school will be connected with the railroad company's wires, so that the students can listen in.

J. A. Jones, Superintendent of Telegraph, Southern Railway.

Mr. James A. Jones, chief clerk to the superintendent of telegraph, Southern Railway, has been promoted to the position of superintendent of telegraph of the same road with headquarters at Washington, D. C., the change taking effect December 1.

J. A. JONES.

Mr. Jones was born in Leaksville, N. C., in March, 1873, and began railway work in January, 1890, with the Richmond and Danville Railroad as operator and agent, with which road and its successor, the Southern Railway, and the Western Union Telegraph Company, he has been continually identified. Later he was engaged in installing multiplex telegraph apparatus at different points along the road, and was subsequently appointed chief clerk to the superintendent of telegraph, which position he held at the time of his recent advancement.

Mr. Jones is a man of high and pleasing character and during his service with the Southern, its predecessor and the Western Union Telegraph Company, has become thoroughly familiar with railroad and telegraph matters in all branches.

Telephone and Telegraph Development for Railroad Service.

The Association of Railway Telegraph Superintendents appoints each year special committees to investigate and report their findings and recommendations in regard to anything which shall be for the advancement of the efficiency of the telegraph, telephone and other electrical departments of the railroad service, and Special Committee No. 6 was appointed to cover telegraph and telephone development, the following being the membership: E. C. Keenan, chairman, general superintendent telegraph, New York Central Lines, New York; J. H. Finley, assistant manager, supply sales department, Automatic Electric Company, Chicago, Ill.; L. M. Jones, superintendent telegraph, Santa Fe System, Topeka, Kan.; L. B. Foley, suuperintendent telegraph, Lackawanna Railroad, New York; T. R. Gooch, superintendent telegraph, Richmond, Fredericksburg and Potomac Railroad, Richmond, Va.; G. K. Heyer, railway sales engineer, Western Electric Company, New York; C. S. Rhoads, superintendent telegraph, Big Four, Indianapolis, Ind.; David Sarnoff, contract manager, Marconi Wireless Company of America, New York, and J. J. Ghegan, president, J. H. Bunnell & Company, New York.

The purpose of this committee is to keep the association in touch with all developments of the telegraph and telephone as they occur. Members of the association who desire to have general investigations made or who know of developments which would be interesting are invited to call the attention of the chairman or the members of the committee in regard to the same, in order that all questions may be properly and systematically handled.

It is not the intention of the special committee to handle subjects in detail but to report such developments as seem worthy of consideration, so that the members of the association will be fully advised.

It is the purpose of the committee to start an active canvass and any suggestion of improvements, developments, etc., will be appreciated.

Recording Congressional Votes by Electricity.—An electrical score board is to be installed in Congress for the purpose of recording votes on roll call. It is said that the time occupied in taking each vote will be reduced from forty minutes to as many seconds. The machine automatically adds the vote and displays the result.

INDUSTRIAL.

Alternating Current Telegraph Sounder.

The Murphy Electricity Rectifier Company, Rochester, N. Y., has recently brought out an alternating current sounder, of which the following is a brief description:

The current from the line through the main line relay keeps the armature normally against the front contact, permitting current from a small alternating current transformer to energize a winding on a laminated core. On the opening of the main line and the consequent demagnetization of the relay the armature makes contact with the back stop, thus energizing one coil of the transformer. The sounding lever of the transformer, fulcrumed on the center or common leg of the laminated core of the transformer, is alternately held yieldingly in contact with adjusting screws kept continuously magnetized by a permanent magnet. The function of the magnet is to prevent chatter and hum of instrument and renders the telegraphic sounds uniform.

The dimensions of the transformer case, including the secondary voltage regulator, is 3x6x4½ inches high. This transformer is capable of operating fifteen or twenty sounders simultaneously. Energy taken by the sounder is approximately four watts. The magnetizing energy taken by the transformer is so small that the primary may be left in circuit continuously, as the ordinary integrating watt-meters will not indicate the energy consumed.

The function of contacts on the transformer is to adjust the voltage to the best operation of the sounder. Under proper conditions it is practically impossible to tell whether the sounder is connected to an alternating or direct current circuit.

Our Patent Department.

The Patent Department of this publication (see advertisement on page IX), is in charge of Mr. W. B. Vansize of the New York Bar, an attorney at law and solicitor of patents of extensive experience.

Mr. Vansize was employed by the Edison General Electric Company as an expert in its litigation involving electric propulsion on rails; by the Electrical Accumulator Company in its litigation with the Brush Company and the Julien Company, involving secondary battery patents; also by the Western Union Telegraph Company, the Postal Telegraph Company and the Western Electric Company. He has had long and extensive experience as an expert witness in matters involving patents on electrical apparatus of various character, such as electric railway signaling and fire-alarm apparatus, printing telegraphs and multiple telegraphs, and he is at present the solicitor and an expert in the employ of the Marconi Wireless Telegraph Company.

Our arrangement with Mr. Vansize enables us to place his ability and experience at the service of our readers and we know that he is able to render efficient service in obtaining United States and foreign patents and in patent litigation generally.

Street and Station Indicator for Cars.

H. K. Duffield and W. Z. Musgrave, two well-known Atlanta, Ga., telegraph operators, have recently invented and placed on the market a street car indicator. The device is intended to show the name of the next street the car is approaching. It has already been tested by a number of companies in various cities and it has been pronounced a success. The device can also be used on steam railroads as well as elevated or underground systems. Messrs. Duffield and Musgrave are about to begin the erection of a $10,000 plant to manufacture their indicator to supply the growing demand for the devices. Both Mr. Duffield and Mr. Musgrave are well-known telegraphers, having a record of over thirty years' service to their credit, most of this time being in the employ of the Western Union Telegraph Company. Mr. Musgrave was at one time a member of the Postal force in New York.

New York Telegraphers' Aid Society.

The statement of the New York Telegraphers' Aid Society for the quarter ended December 6 is as follows:

Balance on hand September 6		$25,150.20
Receipts		1,413.25
Total		$26,563.45
Disbursements—		
Death Benefits	$200.00	
Sick Benefits	565.00	
Expenses	192.90	
		957.90
Balance on hand December 6		26,605.55
Total		$26,563.45

RELIEF FUND.

Balance on hand September 6	$6,059.86
Receipts	491.19
Total	$6,551.05
Disbursements	417.35
Balance on hand December 6	6,133.70
Total	$6,551.05

Morse Telegraph Disc Records are again available, and the demand for them can now be fully met. These discs supply sixteen lessons in Morse telegraphy and can be used on any make of talking machine. There are eight of them, all with records on each side, and the lessons are in easy, progressive stages. An advertisement on another page tells more about them. Send orders to Telegraph and Telephone Age, 253 Broadway, New York.

The Telephone and Telegraph Life Insurance Association has levied assessments 613 and 614 to meet the claims arising from the deaths of Mary A. Fitzpatrick Doherty at New York; J. Devlin, White Plains, N. Y.; W. Danforth, Asbury Park, N. J.; T. Robinson, Ottawa, Ont.; R. Allen, Moberly, Mo.; G. J. Bascom, New York; T. R. Fox, Poughkeepsie, N. Y.; P. H. McDowell, San Francisco, Cal; H. Neumann, New York; M. C. Coyle, Bay City, Mich.; A. H. Macy, North Dartmouth, Mass.; A. A. Ferris, Brooklyn, N. Y.; W. E. King, Brooklyn, N. Y.; W. A. L. Tarr, Pueblo, Col.

Efficiency Engineering in the Telegraph Service.

(Continued from page 588, December 16, 1916.)

Courtesy of employes as well as employers is a subject that is receiving much attention by everyone who is making efficiency a study. It is recognized that "public be damned methods" which, thirty years ago were manifest, have been replaced by courtesy, and the "what are you going to do about it" is never used to impress a person with the idea that if he does not like the treatment meted out to him he can do the next thing. If it were the easiest thing in the world for a manager to win the confidence of the public it would be a work of supererogation to offer any comment on plans of procedure calculated to attain that end. One authority tells us, however, that "confidence is a plant of slow growth."

The telegraph is a public utility. It is not necessary or perhaps pertinent to go into all of the factors that contribute to make successful the efforts of any corporation in its dealings with the public. The same authority states that in the first place, it goes without saying that every public utility that is slated for success must have behind it an honest purpose, sound integrity in its operation and a genuine desire to give thorough satisfaction to the public it serves. These are fundamental and all essential elements. However, these elements alone will never make the soil produce the plant of public confidence in the fullness of perfection.

Courtesy is the great lubricator—the oil that keeps the machinery of modern business running smoothly and efficiently. It is the outward and visible sign of an inward and actual desire to please—the motive which must be the foundation purpose of every successful business enterprise. This desire and the courtesy which expresses and interprets the desire to the great public are the best selling agents any utility can hire. They establish and preserve friendly harmonious relations with the public. Pleasing means succeeding, for the simple reason that your pleased customer never keeps the fact to himself; he is an indefatigable communicator of his satisfaction to others. On the other hand, he is no less given to publishing his dissatisfaction, which is still another argument in the case.

Of course, this courteous attitude on the part of the company's employes, vital as it is, is not going to be anything more than an empty form unless it is strongly backed up with the company's service.

The central power must look upon itself not only as a seller of service, but distinctly as a giver of service. And every single department of the utility must consider itself directly concerned in giving that service. It is important for employes of public service utilities to remember that everything they do or say has of necessity a direct effect upon the success or failure of their company. They cannot consider themselves detached units, mere cogs in the wheel; they are of the very fabric of the company. Officials, employes and public constitute a composite whole whose interests are in a peculiar degree mutual and identical.

Officials and employes alike should maintain an attitude of full and hearty sympathy with all their departments making it their business to "pull together." Co-operation pays. The co-operative attitude pays.

The same authority has this to say on the subject of Personal Efficiency: Many young men have lost their opportunity for promotion by grumbling about something which was outside of their line, or work, which they thought someone else should do. If there is anything a man of affairs does not like, it is a grumbler or a kicker. What a depressing, demoralizing influence there is in the attitude of mind of always thinking that somebody is trying to get our place away from us. It creates lack of ability to do our work as well or better than anybody else can do it. It is a constant depression; it tends to make our interest in our work wane and to strangle enthusiasm. Very few can do their best work with spontaneity and creativeness when they are full of fear lest someone else gets their place. They imagine things which really could not materialize. They develop such a suspicion which lowers the grade of their work and also to openness and largeness of mind.

The best way to do is to work so conscientiously that our employers would never think of giving anyone else the position, or doing anything else but to advance us.

(To be continued)

United States Military Telegraph Pension Bills.

President William Bender Wilson and Secretary David Homer Bates, of the Society of the United States Military Telegraph Corps have sent an inspiring circular to the surviving members of the Corps urging them to communicate with their congressmen and senators, asking immediate action on H. R. Bills, 356-650 and 6913. S- 4200 and 1578.

"It seems too bad," they say, "that the government has so far neglected this worthy cause and has left it to a private citizen of foreign birth, Andrew Carnegie—founder of the Corps—to take the place of the government in giving a private soldiers' pension to needy military telegraphers and their widows."

UNIVERSALITY OF THE TELEGRAPH.—One day recently a man in Somerville, Mass., received a message announcing the death of his brother in Wickenburg, Ariz. It was desirable that the body should be sent east for burial. The only available funds were $400 to the credit of the deceased in a savings bank in Oakland, Cal. The existence of the money was verified by wire and after the exchange of several telegrams the bank agreed to release the money, providing all of the living heirs signed an affidavit. To consummate such a task would mean two weeks or more using the mails as some of the heirs lived in Canada. Manager Reynolds of the Somerville office suggested that the Canadian heirs be wired for power of attorney to sign the affidavit. That was done, the power of attorney secured and a satisfactory message was sent to the Oakland bank. The next day the money was received and the arrangements for the shipment of the body were satisfactorily completed.

The Earth as an Electrical Conductor.

At the meeting of the Association of Railway Telegraph Superintendents in St. Paul, Minn., June 20 last, Prof. George D. Shepardson, professor of electrical engineering, University of Minnesota, Minneapolis, gave an interesting talk on the use of the ground as an electrical conductor.

The earth as a conductor, as part of an electric circuit, he said, may be thought of in two ways—as a great reservoir or as a sort of conductor like a great wire. Let us try a water analogy. If we should pour water into the ocean, we should not ordinarily see very much result. If, however, we had a very large stream of water, such as the tides, we would see some effect, the level being changed appreciably. Next, suppose the water to fall not on the ocean, which can move easily and readily adjust its surface levels, but to fall on the hills or on a pile of sand; then the motion of the water is impeded, and it does not settle to its final level for a considerable time, and a comparatively small amount of water may have widely differing levels. Here are simple analogies to the use of the earth as an electrical conductor. In some cases we may think of electricity going into the earth as into an immense reservoir whose level is not appreciably affected; in some other cases it goes into the earth in such a way that there is considerable resistance, similar to that the water meets when running off from hills and through the ground.

An example of the electrical use of the earth as a great reservoir or ocean is the lightning arrester. If a charge of lightning strikes any of our circuits, then, if we were fortunate in the selection and maintenance of our protectors and ground connections, the charge will go into the earth as though into a great reservoir, and it may not make any disturbance. If, however, the charge meets opposition while going into the earth, then we have the electrical levels changed, and the current may seek other paths. It is somewhat similar to what we have in our water powers; these utilize the differences in the level of the water which has been deposited on the upper parts of the country; we direct that water through water wheels, so that on its way down toward lower levels it does work for us. In a somewhat similar way, the currents in the earth, whether from lightning or from commercial sources, may get into other circuits and disturb them, or might even be utilized.

By a study of the elements which compose the resistance in the earth, we become able to estimate how much a given current will disturb the electrical levels, or how much current will be required to produce a certain amount of disturbance, or how much voltage will be required to send a given current into the earth. With some modification, the ordinary rules for electrical conductors are applicable. We know that the longer a wire is, the greater is its resistance, and that the thicker the wire the less is its resistance. We also know that the resistance of a copper wire is less than that of an iron wire of the same size and length in other words, that the resistance depends upon a property of the material, which we call its "specific resistance." The electrical resistance in a conductor, no matter what its shape or material, may be expressed in three elements: the length, the area of cross-section, and the specific resistance. (This does not take account of the effect of temperature or of the effects of induction and capacity upon alternating currents.) When it comes to the resistance of an irregular conductor, such as the path of current between a ground connection and the general body of the earth, the application is somewhat complex and involves a more or less tedious and troublesome application of mathematics.

Now let us consider another point. The specific conductivity, or its reciprocal, the specific resistance, of the earth is important. The resistance of dry earth is high, that of damp earth is comparatively low. We obtain low specific resistance by placing our earth terminals in permanently damp earth, as by digging deep. We may help some by keeping the ground moist, as by retaining water in some way. One has proposed forming the ground plates into cups to hold the water after a rain, a rather temporary expedient, for the ground near the plate should be permanently damp. A more promising plan, where naturally permanent dampness is difficult to reach, is to put into the earth some substance which will hold moisture by special attraction. An old method was to bury the plate in charcoal or coke, materials which have strong affinity for moisture. A later method is to bury the ground plate or terminal with salt or chloride of lime. The main thing is to keep down the specific resistance of the earth close to the ground plate.

In the actual measurement of the resistance to earth, inaccurate results are sometimes obtained because of failure to appreciate that the terminals should be a considerable distance apart. The method of the Bell telephone companies is quite satisfactory. They use a Wheatstone bridge with alternating current obtained from a buzzer circuit, and with telephone receiver instead of galvanometer, and measure the resistance between each two of three ground rods from the three measurements, the resistance of each separate ground may be computed. It is necessary to keep the ground rods or plates a considerable distance apart, in order to avoid getting false results.

MISLEADING ENVELOPES UNMAILABLE.—The Post Office Department has decided that an envelope apparently intended to resemble those used for telegraph messages and bearing the words "Postal Delivery Service" is unmailable. Similar action has been taken regarding an envelope bearing the words "National Mail Dispatch Service," with other marks and designs such as "Night Letter," "Pay No Charges on This Message," "Contains Important Message."

NEW TELEGRAPH CHARGES IN AUSTRIA.—Telegraph charges have been advanced in Austria from 1.2 cents to 1.6 cents a word, with a minimum charge of twenty cents, with the view of raising revenue to pay the interest on the war loan. It is calculated that as a result of this action $18,270,000 additional revenue will be procured.

MR. JEFF W. HAYES' DEPARTMENT.

Copies of each issue of Telegraph and Telephone Age may be purchased at the office of W. T. Plummer, Room 901, Postal Telegraph Building, Chicago. Mr. Plummer will keep a supply of each issue on hand to meet every demand.

City of Destiny.

When one views the modern telegraph office with its elegant appointments and compares it with the indifferent, and oftimes disgraceful appearance of those very same offices a few years ago, he is ready to welcome the change.

Many telegraph offices out West were "offices" only by compliment and not worthy of the name.

It was so hard to get the company to allow any expenditure for refitting or refurnishing that a manager would be filled with the idea that his position was in jeopardy were he to be in any way urgent or persistent in his requests for an appropriation to rehabilitate his office.

Tacoma, the "City of Destiny" as the real estate sharks delighted to call it, had sprung up from an Indian fishing village to a pretentious city, with lofty edifices and more under construction. It was backed up by the Northern Pacific Railroad who desired to make this place the chief city on Puget Sound.

It was about the year 1885, that Col. R. C. Clowry, accompanied by C. H. Summers, electrician of the company, two superintendents and other officials departed from Portland, Oregon, destination, Tacoma.

The writer, being well acquainted on the Sound was invited to join the party as far as Tacoma, which invitation was accepted.

It was a never to be forgotten trip, and one filled with humorous incidents.

The gentlemen composing the party were well groomed, dignified and wise looking.

A little gentle rain was falling when the party reached Tacoma, and carriages to convey them to the telegraph office were pressed into service.

The ride up town showed many improvements, present and prospective and the vicinity of the telegraph office was soon reached.

And such an office! How can I describe it?

It was situated on the side of a hill at an angle of fifty-five degrees. There were no paved sidewalks and as the streets resembled a vast mill race of mud and water, the party abandoned their carriages on Pacific Avenue, performing the remainder of the journey, 200 feet, on foot, picking their way as best they could over the mucky sidewalk.

Arriving at the telegraph office, a scene met their eyes that made some of the members of the party laugh outright.

The sign, which was of the old fashioned pattern, with blue back-ground and red lettering was suspended upside down, covered with numerous quids of tobacco, evidently aimed at it by competent chewers of the weed. A streamlet of water which trickled down the edge of the sidewalk emptied itself into the office through a hole in the bottom of the door.

Inside of this room was a layer of an inch of mud covered with a couple of inches of water.

A small deal table used for an operating table, upon which were two Morse sets, one fairly good cane-bottomed chair and two other chairs with a leg gone from each, completed the furnishings of this very modest office of the City of Destiny. There was no counter, switchboard, or any other token to identify this room as being a telegraph office, and a general smile went up among the visitors.

S. T. Armstrong, who had been once upon a time superintendent at Denver, was the manager and John M. Bell, still a resident of Tacoma was the operator.

Coal oil lamps and tallow dips were the illuminating plant and as for heating, each man kept his overcoat on.

It did not take the Colonel very long to authorize the use of the emergency fund and before the departure of the visitors a grand and well needed transformation had taken place in the Tacoma office.

It is doubtful if there could be a more disreputable looking telegraph office in the country than this one which I have tried to depict, and it was certainly not the fault of the local management that it was so.

The Tacoma office of today occupies the same site as in former years, but, what a change! The new organization effected radical changes and the smiling faces of the well dressed manager and his assistants who greet you is a much more inviting picture than the Tacoma office of 1885.

The Pleiades Club.

CHAPTER IV.

It was Chicago day on the planet Mars and from every quarter of our nearest starry neighbor came flitting the individuals who at one time or another worked in the Chicago telegraph offices.

It did not matter what company was the employer, railroad or telegraph; all were as welcome as the flowers in May and all felt at home.

There were many familiar faces and it will be our privilege to mention many of the dear denizens of this happy stopping place, where all is peace and harmony and where our telegraph and railroad friends obtain their first taste of heavenly happiness.

Al Baker presided over the meeting and announced that James E. Pettit would be temporary secretary for the Society of the United States Military Telegraph Corps.

"Why not make John Brant secretary for the Old Timers' association; also, it would look so much like olden times," said Col. John J. Dickey, and the suggestion evoked much applause and presently both gentlemen were at their desks wielding their pens just as they used to do on earth.

"They used to call me the 'old preacher' when I was night chief operator of the Chicago office," began the president, Mr. Baker.

He was interrupted by Fred Swain, who remarked that they had often heard A. B. Cowan relate incidents showing his tendency toward Biblical lore.

"Yes, I have heard the story," replied Baker. "It occurred on the ocasion of a big storm in Chicago, but we are here today to talk 'shop' and I hope we will hear from many of our friends present, for we can tell something interesting, each one of us."

"I have a few preliminary remarks to make and I hope our beloved secretary, Mr. Brant, will report me as correctly as possible.

"I want to convey to the telegraph people on old Mother Earth that it is a psychological fact that if they would only make their profession a life-long business, similar to that of a doctor, dentist, lawyer or minister, their condition while on earth would vastly improve. They should take advantage of all the education obtainable in their line, through reading and studying text books on electrical matters and endeavor to qualify themselves for higher positions which are bound to come.

"It will not be long ere the prevailing company will build into Mexico, and, in fact, cover South America. Those fellows down there need somebody to show them how to telegraph and I guess there would be a great number of good tutors in New York, Chicago and St. Louis, and just fancy the revenue that would be derived.

"The opening of this southern country would give every ambitious and capable man in the service an opportunity of shining as a superintendent or in some other official capacity.

"You remember, boys, how they used to sing after the war of the rebellion a ditty about 'Uncle Sam is rich enough to buy us all a farm.'

"Well, the telegraph company is rich enough to make all capable men a superintendent in South America.

"Of course you understand, boys," he continued, "that the subject we are discussing will not interest us personally, for we are all now 'about our Father's business,' but it is a happy thought to know that our loved ones on earth are going to be provided for".

Mr. Baker's remarks were greeted with much delighted applause and secretary Brant stated that he had made a stenographic copy of the same, which he would hand to Fred Moxon, who in turn would transmit it by telepathy to his friend on the terrestrial planet.

"We will now listen to the Chicago Glee Club," remarked President Baker, and vociferous cheers went up as the forms of Sam Bracken, Al Babb, Jim Delong and Harry Smith appeared, each bearing a harp of a thousand strings.

Some of these gentlemen could not warble a note while on earth but were now students of music and harmony, and well did they acquit themselves, even indulging their audience in a little rag time.

Al Babb was particularly happy in his illustrative indian war dances, scalp dances and the like.

Applications for membership into the Chicago branch of the Pleiades Club brought out many hundreds of new and old faces, and as time was no object to them it was decided to hold this as a continuous meeting until everyone was ready to acquiesce in adjournment.

"Boys, I am interested to visit the next 'mile-post' in our eternal flight," remarked "Dad" Armstrong as he came on the platform to shake hands with President Baker.

"I would like to go up to Jupiter for a month or so," continued Armstrong, but he was interrupted by Ed Whitford, who exclaimed, "Better go a little slow, Dad; you know if you climb upwards you cannot come back, for it is just like the butterfly and caterpillar. You have to keep a-going if you start," and here Whitford paused and presently sang that good old hymn, "I'm a pilgrim, I can tarry but a while."

Armstrong, to the delight of the club, concluded to tarry a while longer.

"I notice we have Henry C. Maynard with us today," said the President. "Will he kindly step to the front?" Cheers rent the air as Mr. Maynard's familiar figure mounted the platform.

"I say, Brother Maynard, do you remember the night you told me, along about eleven o'clock, that you could now dispense 'without' my services?"

The speaker was Billy Wallace, and his remark occasioned much merriment.

"Oh, yes, I remember very well," returned Mr. Maynard, "but you know that I did not care so much for the queen's English as I did to see the 'C U B' was promptly handled on the overland.

"I am very glad to see this happy throng," continued Mr. Maynard, "and I am perfectly willing to have 'Chicago day' last for an entire year, for I believe there would not be one dull moment during this period.

"I will have occasion to address you quite often during the meeting."

"Can you tell me, please, who it was that got 'and a city' for 'audacity'?" questioned J. DeWitt Congdon.

"I am the 'guilty' man, for I got that the same night that the young fellow in Galveston reported that Tom Brown, a negro, was found 'guilty' of murder," exclaimed Charley Hazelton, who sat near 'c g.' "

"We will be glad to hear from Pete Rowe and listen to some of his wild and woolly experiences in Elko, Nev.," said the president, "but we will hearken first to a song by Les Bradley, who will favor us with 'Pat Clancey's shovel.' " The song was rendered in the most inimitable style by Bradley, but we will reserve Pete Rowe's story for a subsequent number.

Reminiscences.

BY J. T. SPENCER.

I heard the other day of the death of "Billy" Grier, who, for many years was one of the very finest operators on the Pacific Coast, and as a beautiful and fast sender had few if any equals. He was surely speedy. During the '80's Billy worked in "CP" office for the Southern Pacific with Harp. Prap, Billy Williamson and Mike Griffin, and about this time Horace Jones, also another well known telegrapher on the coast went to work for the same company in the master mechanic's office at Sacramento as operator and clerk. They were fast friends. Billy used to save all the long messages for "Sacto" until he got considerable of a stack and would then start in to "paste" Horace. This continued for several months, but old boy "X" was always equal to the task, and at the close of each engagement Billy wondered more and more why Horace never opened up. Billy finally asked Horace why it was, and Horace explained by saying that he had been copying it all in shorthand, and of course the joke was on Billy. At any rate he never tried to worry Horace after that.

Jeff Hayes Joins Eastern Publication.

Jeff W. Hayes, known in Portland for over a quarter of a century as telegraph operator and operator of a messenger service, has become associated with the TELEGRAPH AND TELEPHONE AGE, a New York publication of national repute. Hayes, who lost his sight a number of years ago, will have headquarters in Chicago and will gather items for the paper while traveling in the interest of his own books.

Hayes is an entertaining writer of stories of the telegraph, his memory reaching as far back into California as the early '70s and the stories include many that came from personal association with men whose names are household words in California and others that came to him second-handed.—*Portland, Ore., Journal.*

Indianapolis Western Union.

The city of Indianapolis is very beautiful and is the home, past and present, of several people who have taken part in national affairs, figuring as presidents and vice-presidents of the United States.

The most interesting person connected with the telegraph in Indianapolis is John F. Wallick, who, although quite advanced in years, comes to his office daily, pursuing the same routine of business that he did forty years ago. Long life to him.

Mr. J. C. Nelson, district commercial superintendent, with his happy smile and genial manner, welcomed us to his adopted city and rendered our stay there both pleasant and profitable.

J. M. Taylor is day chief operator. L. V. McIntire presides over the office at night and is a vigilant, zealous worker in the company's interest, and a very pleasant gentleman. He is ably assisted by Mr. Everoades.

A very pleasant and efficient gentleman is Howard S. Sarber, who is one of the stars of the operating room. We were pleased to meet among others the following ladies and gentlemen: P. E. Carey, J. E. Broden, Alta Parks, D. R. Phillipe, Iva M. Sharkey, Frank H. Helton, Maurice Hemsworth, John J. Gorman, Daisy Rollings, Leo E. Suesz, J. J. Fierek, Robt. E. Omelia, R. Schwarzer, Gus O'Connell, V. S. Herbert, Jessie G. Davis, S. C. Armstring, E. A. Bradbury, Myrtle Holloway.

Atlanta, Ga., Postal.

It is said about the Atlanta Postal office that the employes seldom die and never resign. The old spirit of the Postal Telegraph-Cable Company exists in the south, particularly in Atlanta, Birmingham and New Orleans. It gives us much pleasure to print the roster of the Atlanta office, as follows: G. H. Usher, general superintendent; G. W. Ribble, superintendent; C. G. Knapp, chief clerk to the general superintendent; H. W. Pearce, chief clerk to Superintendent Ribble; B. S. Price, superintendent construction; L. A. Minor, chief clerk to the superintendent of construction; J. F. Heard, general electrician; F. F. Pursley, division cashier; F. J. Poundstone, claim clerk; M. C. Welch, general foreman; L. L. Bennett, chief stenographer; A. M. Beatty, manager; G. W. Oliver, cashier; H. P. Thornton, chief operator; D. C. DeLany, night chief operator; R. F. Williamson, assistant chief operator; operators J. C. Ewing, E. W. Pate, C. A. Simpson, Miss B. Hart, R. M. Cleveland, W. J. Thompson; branch managers Mrs. E. Estes, E. C. Williams, Mrs. L. V. McKinnon, Mrs. E. Mulkey, G. W. McGaughy, Miss E. M. Stoddard, Miss L. F. Stone; branch operators W. B. Spurlock, V. J. Young, Mrs. M. C. Curiton; Mrs. E. B. Williams, bookkeeper; J. E. Arnold, delivery clerk; Miss L. Holt, bill clerk; E. Coker, check clerk; P. Earle McGuire, night clerk; Miss Eugenia Ivey, stenographer; S. C. Shelton, collector; Mrs. A. Maxwell and Miss M. Meaders, telephone clerks; G. W. Scott, night telephone clerk; Mrs. C. E. Griffin, receiving clerk; Miss L. B. Smith, long distance telephone clerk; Miss G. Canova, extra long distance telephone clerk; Z. W. Shelton, address clerk; L. E. Williams, assistant delivery clerk; J. F. Hoffman, call circuit clerk; C. Ramey, copy clerk; J. Huff, janitor.

Birmingham, Ala., Postal.

It is with much pleasure that we chronicle the names of the people we met in the Postal Telegraph-Cable office in Birmingham, Ala., and we are only sorry that we cannot produce each and every one's photograph so that the telegraph world might become better acquainted with the boys and girls of that office.

The Birmingham office is the "Gem" of that company in the South. Much business is transacted here and every message sent from this office leaves it with a rush. All of the operators send fast and they can all take their own sending. We found Messrs. Albert Klein, chief operator, and T. D. Jackson, manager, on hand to welcome us to their city and they were untiring in their efforts to make our sojourn pleasant. We are under many obligations to W. H. Jackson, chief clerk to Superintendent W. C. Lloyd for the part he took in making our visit profitable and enjoyable.

Keen interest was manifested in TELEGRAPH AND TELEPHONE AGE by the entire force and we left the Alabama metropolis with a warm feeling for everybody we met. Mr. J. F. Heard, electrical engineer, came over from Atlanta on a business trip and it was a pleasure to get acquainted with this gentleman. Superintendent W. C. Lloyd was out on a tour of inspection in his district, so we did not have the pleasure of meeting him or his little son, who "comes down to the office on Saturday to help out his father." Mrs. Willie Drinkard is stenographer to Superintendent Lloyd and is a most competent person.

Following is the complete roster of the Birmingham office: T. D. Jackson, manager; Miss G. B. Gregg, manager, Morris Avenue branch; J. M. Martin, cashier; C. H. Locke, delivery clerk; K. L.

Robb, J. M. McArver, Miss V. Adair, Miss L. Elliott, Miss L. Whitworth, Miss D. Adair and Mrs. W. A. Heath, clerks; A. Klein, chief operator; Mrs. M. L. Williams, timekeeper and clerk; F. N. Andrews, wire chief; R. D. Burger, night chief; R. L. Figgatt, all night chief; E. E. Hydinger, traffic chief; T. W. Collins, R. A. Weltz, J. A. Price and C. J. Raley, assistant traffic chiefs; W. C. McCain, quad chief; and the following operators: J. H. McCulla, B. F. Mapp, G. E. Zellner, Wm. Wenger, J. H. Armstrong, J. W. Davis, L. E. Gray, A. C. Bailey, J. W. Cobb, C. E. Barrow, R. S. Pope, Jr., L. M. Butsch, J. R. Rogers, J. W. McClymon, A. M. Livingston, P. H. Perry, H. F. Williams, H. H. Nelson, R. S. Swett, W. E. Jones, L. H. Baker, R. M. Pollock, J. A. Latture, V. C. Blake, W. Z. Higgins, G. F. Sims, T. H. Hubert, H. B. Wilder, J. D. Haylow, J. D. Thomas, O. W. Martin, E. W. Edwards, A. L. Norris, G. D. Hodge, J. L. Poole, J. D. Carlisle, J. A. Rodriguez, J. V. Huffmaster, W. P. Mooney, M. F. Campbell, J. B. Neele, W. D. Gray, C. A. Thornburg, R. P. Jones, M. W. Hehl, H. F. Atkinson, B. E. Sullivan, J. C. Burgess, R. G. Mays, F. G. Rodruguez; M. Lipscomb and S. McCracken, service clerks; H. Herbertson, Commercial News Department; H. Brevard, O. Nolan, J. Juneman, Wm. Gentry, H. Woodrow, E. Shepherd and C. B. Jones, check clerks.

Cincinnati Postal Notes.

There is no city in the country that has as many "At home" operators as Cincinnati. Operators are born, bred and die here, making but little disturbance in the social telegraphic world, each having a niche all by himself.

This is so with the Cincinnati Postal office, where there is a merry and happy lot of operators. We are glad to append their names. J. W. Pons, assistant chief operator, is a live wire and never does things by halves. He is an ardent worker in every good cause; C. F. Printz, chief operator, is well selected for the position and is very popular with his men, and zealous in the company's interest; C. H. Minning, manager, never lost a bet when it comes to making or creating business for his company. He is exceedingly well-liked in the Cincinnati community, a fact which brings revenue to the company; operators, Wm. Donellon, Louis Hurtwitz, New York bonus wire, first; T. B. Hasson, E. J. Kippenbrock, Chicago bonus wire first; W. C. Brandhirst, Pittsburg bonus; Miss B. H. Neiderhauser, A. L. Bruch, Cleveland duplex; Miss Agnes Gerver, St. Louis duplex; Miss C. M. Craig, Louisville duplex; J. R. Willis, Miss M. P. Rice, Birmingham duplex; Miss M. A. Mack, Detroit duplex; W. Williams, Indianapolis duplex; others working around are: L. E. Martin, H. Geibel, W. Ewald, L. Hagerdorn, H. Krummen, H. Roehr, H. Van Arnem, W. Moore, C. E. Ward, H. Uhl, C. Keyes, G. Dickinson, E. Brenneke, E. Mestel, H. T. Tucker, J. H. Harding, L. A. Crane, C. F. Bosse, wire chief; W. H. Keer, city traffic chief; W. Geibel night chief operator; C. M. Ploss, assistant night chief; Wm. Hargis, late night chief; S. J. Minning, cashier; Miss M. Steele, assistant cashier; H. Saatkamp, in charge of the messenger department; E. Bell, delivery clerk.

LETTERS FROM OUR AGENTS.

NEW YORK POSTAL.

Among the active telegraphers of today who was one of the spry young men that moved from the old Western Union main office at 145 Broadway to the more pretentious quarters at 195 Broadway, away back in 1875, was "Billy" Williams, who is now a member of the early night force in this office. True, as it appeared in the roster of the newly established general operating department at "195," printed in *The Operator* for May 15, 1875, it was W. S. Williams who carried his "grip" in hand, pen and stylus in vest pocket, and his art in his brain, as he marched forth from 145 that busy moving day to resume his brasspounding activities at "195." To us he will ever remain just plain "Billy" Williams. Incidentally, Billy was editor of *The Operator.* This publication was replete with matter of interest to telegraph operators, and certainly deserved the popularity it enjoyed. *The Operator* was published semi-monthly from 1874 until December 30, 1882, and weekly as *The Operator and Electrical World,* January 5, 1883, until April 21, 1883. Mr. Williams relinquished the venture about this time, but the publication continued to exist for a short time with varying fortune and was succeeded by *The Electrical World.* "Billy" was closely associated in those early days of the telegraph with such notables as Thomas A. Edison, J. N. Ashley, Tom Allen and others. He is still doing excellent work despite his almost half a century of active service.

The remark is often made that there are few telegraphers in the business today who can write with a pen as well as could the operators of old. It must be admitted that the number of those who can "sling the quill" with the facility of the old-time experts grows fewer with the flight of time and the general introduction of labor-saving devices, but there are still a goodly company in the ranks who can and do write with all the grace, ease, speed and peculiar telegraphic embellishments of the best of the old school. There are in existence two record books whose pages are ornamented with the graceful penmanship of New York operators of forty years ago. Donald McNicol an associate electrical engineer of this company, who has a penchant for things historical in the realm of Morsedom, has opened the pages of a brand new record book to operators who can write "a good fist" and are not averse to inscribing a few lines over their signature for the information of operators yet unborn, thereby silently testifying that in 1916 the art of the penman was not totally extinct. The contributions made to the volume thus far include both original and copied matter. When the book is filled, it will prove mighty interesting reading, besides providing a thrill of delight for the student of telegraph lore. It is not Mr. McNicol's intention of restricting the scope of the record to New York operators alone. On the contrary, he will endeavor to secure as varied a collection of pen masterpieces as possible, from all sections of the country.

Scientific discussions are becoming a promising feature of the gentleman's smoking and rest room in contra-distinction to the erstwhile heated political or European war debates. Annunciator chief Joseph Sullivan recently entertained an intensely interested audience with a dissertation on "How a Pearl is Formed Within an Oyster." Loop chief Ralph Carr told about the growing of oysters, and described the Chesapeake Bay oyster industry. Later the subject of hail-storms was introduced, at the conclusion of which everyone understood to a nicety where hail hailed from.

Operators W. J. Walsh, John Thomas, R. E. Tevis, J. B. Greener and G. B. Gilbert are recent acquisitions to the force. Those who went away to pastures new were operators R. R. Johnson, H. Pierce, B. W. Austin, Chas. G. Burt, G. W. Teeter, L. M. Nagy, I. Switzman, M. J. Kushner and F. A. Becker.

Miss Elsie Brieger, of the Jersey ways, an operator employed in this office for a number of years, has resigned to be married. Persistent inquiry failed to elicit the name of the lucky man.

Mrs. N. S. Bell has been transferred from the main office to the Hotel Astor, as operator. Operator E. Berliner was transferred to the branch office at 548 West 145th Street.

During the month of November, exceptionally fine records were made by many of our operators. In the bonus class Ralph Thompson handled 12,869 telegrams in 219 hours, an average of fifty-eight per hour; Fred A. Becker, 12,621 messages in 202 hours, averaging sixty-two an hour; Max Bernstein, 11,953 in 188 hours; C. R. Schoonmaker, 11,849 in 188 hours; E. H. Schoonmaker 11,709 in 184 hours; the three latter averaging sixty-three an hour. "Bud" F. Rupple and R. McCartney of the first Chicago bonus, nights, handled 10,048 messages in 200 hours, and 9,930 in 198 hours, respectively. In the non-bonus class Miss B. C. Laub maintained an hourly average of forty-three messages throughout the month, while Miss Lillian Schwadron with thirty-eight an hour for 211 consecutive hours is also entitled to recognition for good, conscientious work. Operator T. C. Zoebelin handled 8,228 messages in 254 hours. There were no errors charged against any of these operators.

Lineman R. S. Johnson, stationed at Red Bank, N. J., was a recent main office visitor.

Loop chief Ralph Carr enjoyed his annual vacation during the holidays.

NEW YORK WESTERN UNION.

Martin Durivan has returned to this office for the winter and has resumed his position as supervisor of the Jersey Division. For thirty-nine years Mr. Durivan has acted as chief operator of the Long Branch, N. J., office during the summer seasons.

M. F. O'Neil, one of our old timers, is recovering from penumonia and will be able to resume his position in about two weeks.

J. P. Kelly, chief operator of the Commercial News Department, Chicago, is in New York studying the methods of management of the Commercial News Department in this city, which is presided over by H. M. Heffner, and which is the largest distributing office in the Western Union system.

Over $5,000 of the bonus money paid by the company to operators in this office was deposited for investment with the Serial Building Loan and Savings Institution.

Among recent visitors were D. E. Byers, chief operator, Harrisburg. Mr. Byers had not been in the city in nine years and marveled at the growth of the telegraph business; W. G. Wetmore. division traffic supervisor, Boston, and W. J. Dodge, division traffic supervisor, Pittsburgh.

H. D. Austin, division traffic supervisor, New York, has returned from a hunting trip to Barnegat Bay, N. J. It is stated that he bagged a large variety of ducks.

John W. McMahon has been appointed manager of the branch office at West Thirty-first Street. Mr. McMahon has had a wide experience in telegraph management and is regarded as one of the most capable managers in the service of the company. For the past ten months he has been engaged in outside business.

PHILADELPHIA POSTAL.

L. McCoy was added to the operating department recently.

Sherwood Cox of this office resigned to accept a position as manager for the Postal at Salisbury, Md. Mr. Cox has the best wishes of his friends for success in his new position.

The mother of Monitor P. J. Reilly, Jr., died December 21. As a mark of sympathy from Mr. Reilly's Postal friends a large floral wreath was presented, with the inscription "Employes of the Postal."

INDIANAPOLIS WESTERN UNION.

The following managers have been appointed in this district: J. P. Freeman, Fort Wayne, vice F. B. Bradley, resigned; E. W. Ininger, South Bend, vice J. P. Freeman, transferred; O. G. Bradford, Linton, vice G. Maple.

Former superintendent J. F. Wallick, now retired on pension, is able to be out again after being confined to his home with grip for several weeks.

A gloom of sorrow was cast over a large circle of friends when they learned of the death of Miss Marie Liebrock on October 31. Miss Liebrock was the very efficient and popular manager of the produce district branch office at Indianapolis, and as a mark of respect her office was closed during the funeral hour, by request of valued patrons.

SHREVEPORT, LA., WESTERN UNION.

H. G. Burkhalter has been promoted to be late night chief operator, vice A. Cosgrove, transferred; E. W. Pittman, operator, has been promoted to be late night chief.

R. N. Long, night chief operator, Oklahoma City, has been appointed chief operator at Shreveport, vice C. M. Thompson, transferred to Oklahoma City.

Mr. J. H. Baughman, of the Cleveland, Cincinnati, Chicago and St. Louis Railway Company, Bellefontaine, Ohio, writes: "You did perfectly right in renewing my subscription. Enclosed please find post office money order for the two dollars."

Season's Greetings.

We acknowledge with thanks the season's greetings from Mr. and Mrs. J. W. Freeland, Marion, Ohio; J. McMillan, manager, and W. J. Camp, assistant manager, Canadian Pacific Railway Company's Telegraph, Montreal; John A. Roebling's Sons Company, Trenton, N. J.; Will Y. Ellett, Superintendent Fire and Police Telegraph System, Elmira, N. Y.; F. T. Albert, secretary of the Western Union Telegraph Company's Benefit Fund, New York; S. H. Riker, district plant chief, American Telephone and Telegraph Company, Troy, N. Y.; R. W. A. Horner, chief operator, Western Union Telegraph Company, Lynchburg, Va.; C. M. Coomer, formerly manager of the Western Union, Saginaw, Mich., office, now retired at Belleville, N. J.; George H. Mills, manager, Postal Telegraph-Cable Company, Providence, R. I.; George G. Ward, vice-president and general manager, Commercial Cable Company, New York; P. H. Fennell, manager, Postal Telegraph-Cable Company of Texas, Shreveport, La.; Frank Kitton, plant engineer's staff, Western Union Telegraph Company, New York; M. M. Davis, electrical engineer, Postal Telegraph-Cable Company, New York; P. J. Tierney, Central Cable office, 16 Broad Street, New York; Arthur R. McGrath, superintendent, Western Union Telegraph Company, Chicago, Ill.; George M. Myers, an old time telegraph operator and official and a former president of the Old Time Telegraphers and Historical Association, Kansas City, Mo.; E. W. Collins, general superintendent, Postal Telegraph-Cable Company, Chicago, Ill.; J. F. Skirrow, associate electrical engineer, Postal Telegraph-Cable Company, New York; P. C. Kullman and Company, brokers, New York; E. J. Nally, vice-president and general manager, Marconi Wireless Telegraph Company of America, New York; H. C. Worthen, general manager, Western Union Telegraph Company, Atlanta, Ga.; M. J. O'Leary, secretary, Telegraph and Telephone Life Insurance Association, New York; Earl W. Miller, chief operator, Postal Telegraph-Cable Company, Philadelphia; A. C. Terry, district commercial superintendent, Western Union Telegraph Company, Pittsburgh, Pa.; George E. Sornberger, manager, Postal Telegraph-Cable Company, Williamsport, Pa.; Louis Casper, Western Union Telegraph Company, New York; Arthur Lockwood, secretary, Brookfield Glass Company, New York; S. V. King, Western Union Telegraph Company, Indianapolis, Ind.; Edward Reynolds, vice-president and general manager, Postal Telegraph-Cable Company, New York; Nathaniel Hucker, a forty-niner of the telegraph, Buffalo, N. Y., the oldest and most respected telegrapher in that city; D. C. DeLany, night chief operator, Postal Telegraph-Cable Company, Atlanta, Ga.; C. J. Eldridge, division cable manager, Western Union Telegraph Company, Chicago; Charles E. Davies, traffic superintendent, Great North Western Telegraph Company, Toronto, Ont.; D. F. Ingold, chief operator, Western Union Telegraph Company, Los Angeles, Cal.; Newcomb Carlton, president, Western Union Telegraph Company, New York; Jesse Hargrave, superintendent, Mackay Telegraph and Cable Company, Dallas, Tex.; Charles M. Holmes, Woodhaven, L. I.; H. A. Tuttle, president and general manager, North American Telegraph Company, Minneapolis, Minn.; Saim Salim, of Constantinople, Turkey, now in New York studying the telegraph and telephone systems; W. C. Carswell, manager, Western Union Telegraph Company, Topeka, Kan.; Thos. S. Brickhouse, the winner of the Carnegie Diamond Medal, Los Angeles, Cal.; Joseph Marshall, Western Union Telegraph Company, Savannah, Ga.; T. F. Clohesey, Syracuse, N. Y.

Serial Building Loan and Savings Institution.

The Serial Building Loan and Savings Institution on the last day of the year mailed dividend checks amounting to over $8,500, which represented six months' interest on their investment, to those members who have saved for the purpose of using the income.

Following is a list of the Serial nominations of officers for 1917: President, T. W. Carroll; vice-president, T. M. Brennan; secretary, E. F. Howell; directors, G. W. Blanchard, J. F. Nathan, A. O. Wallis, T. E. Fleming, M. J. O'Leary, W. J. Quinn, M. J. Kenna, P. J. Casey, E. P. Tully, J. F. McGuire, C. J. Ross, C. A. Kilfoyle, C. Jacobson, F. D. Giles, W. B. Dunn.

For Advisory Board, W. H. Baker, C. P. Bruch, J. R. Beard, E. J. Nally, E. F. Cummings, J. A. Hill, M. W. Rayens, J. B. Taltavall, E. Reynolds, W. Quinlan.

The election will be held January 16, the polls being open from 2 to 5 p. m.

32d YEAR

Serial Building Loan and Savings Institution

President, - - - - T. W. Carroll
Vice-President, Thomas M. Brennan
Secretary, - - - Edwin F. Howell

Resources - - - $1,000,000
Surplus - - - - 40,000

Business conducted under the Banking Law of New York

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Western Union Building, 16 Dey Street, 9 a. m. to 5 p. m.
Postal Building, 253 Broadway, Room 1030, 2.30 to 4.30 p.m., Fridays, and each 15th and last day of month.
Telephone Building, 24 Walker Street, Room 1129, Daily 9 a. m. to 2 p. m.
Saturdays 1 p. m.

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No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. J. B. Taltavall, TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

Telegraph and Telephone Age

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NEW YORK, JANUARY 16, 1917.

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Government Ownership Moribund.

Lord Beaconsfield once said, "In politics nothing is contemptible." Just what he had in mind at the time, or in what connection this remark was made, we do not know, but we do know that in the United States contemptible things sometimes get inextricably mixed with politics.

The Honorable David J. Lewis of Maryland, the exponent of government ownership of telegraphs and telephones in this country, who for several years has been boosting this idea, was defeated at the recent election in his race for the United States Senate. If there was no contempt in Mr. Lewis' politics, there was some shown by the voters when it came to the point of expressing an opinion regarding the man and his pet idea. Government ownership is a dead issue in this country, at the present time at least. This being the case, Mr. Lewis is out of a job.

The Messenger Boy Problem.

The head of a large printing establishment in New York found it so difficult to hire office and errand boys that he experimented with elderly men for work in and about the office previously done by boys. Profiting by the experience of telegraph companies who were forced to this course by child labor laws in various states, the publisher advertised for active elderly men to work as messengers. The men employed were given more money than was paid to boys, but it was found that they performed their duties much more effectively, their understanding being better and their reliability being a new asset.

From a humanitarian standpoint, this change in the industrial system must make a strong appeal. It is giving employment to men of from fifty to sixty years who have been displaced by younger men. In all the large cities there are thousands of such men, disqualified solely because of age, desirous of finding light work and believing themselves to be qualified. In most industries there is no age limit for the man higher up, but in the places requiring physical labor the fires of energy frequently are burned out at the age of fifty or sixty. If such men can find employment in the lighter work usually given to boys, the whole nation will be benefited, especially as the boys themselves will have an opportunity to remain longer in high school or college.

In large cities the telegraph companies still experience much difficulty in securing messenger boys and the problem confronting them is a real live one. In Providence, R. I., some college students are carrying messages and in this way help to pay their way through college. This work gives them a wider experience in business life, which will be particularly helpful to them in whatever line of work they take up after graduation. College students cannot be obtained everywhere for this work, however, and the telegraph companies are compelled to seek in other directions for help. Employment of middle-aged or elderly men offers one solution and is to be hoped that this class of workers may be encouraged to take up this branch of employment.

Prepare for Daylight Saving This Summer.

It begins to look as if the so-called "daylight saving" idea would take root in this country next summer in a practical way. The national daylight saving convention which is being held in New York at the time this paper is being issued will give the scheme a strong impetus, no doubt. There does not appear to be any marked objection to putting the idea into practice in this country, although there seems to be some skepticism in spots.

In a movement of this character it requires co-operation to make a success of it, otherwise there would be the utmost confusion. It all depends upon unanimity and co-operation.

The plan is to have all the clocks in the United States turned forward one hour on May 1 and turned back again on September 30, thus permitting the utilization of one more hour of daylight for useful work. It does not impose any more work on the individual than he is now performing; it simply brings working and daylight hours into more harmonious relations, and is one phase of the efficiency movement which is so prevalent at this time.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on January 12:

American Tel. and Tel. Co.	123¼
Mackay Companies	86-88
Mackay Companies, pfd.	66-67
Marconi Wireless Tel. Co. of Am. (Par value 5.00)	3
Western Union	95¾

Telegraph and Telephone Patents.

ISSUED DECEMBER 19.

1,209,279. Telephone Transmission System. To William A. Fricke, Chicago, Ill.

1,209,291. Telephone Apparatus. To Kenneth B. Hastings, Boston, Mass.

1,209,293. Automatic Telephone System. To Harry E. Hershey, Whitewater, Kan., and Geo. A. Yanochowski, Chicago.

1,209,304. Impulse-Transmitting Device. To Alexander E. Keith, Hinsdale, Ill.

1,209,332. Signaling Device for Writing or Copying Telegraphs. To Alphons Rappwenecker, Bremen, Germany.

1,209,397. Transmitting Apparatus. To John J. Comer, Chicago, Ill.

1,209,478. Automatic Ringing Mechanism for Telephone Systems. To Carwitt E. Myers, Ironton, Mo.

ISSUED DECEMBER 26.

1,209,689. Telephone System. To Francis W. Dunbar, Chicago, Ill.

1,209,825 and 1,209,826. Telephone System. To John Erickson, Chicago, Ill.

1,209,834. Telephone - Exchange System. To Chas. L. Goodrum, New York.

1,210,314. Telephone Toll System. To Alfred U. Hoefer, East Orange, N. J.

1,210,386. Automatic Telephone System. To Wm. Kaisling, Chicago, Ill.

New Telegraph Line in Colombia.—A recent Colombian law provides for the construction of a telegraph line connecting the city of Arauca, on the Venezuelan border, with the telegraphic system of the rest of Colombia.

Linemen are always looking for trouble but they never display any scars to indicate that they found it.

PERSONAL.

Mr. W. H. Flann, superintendent of telegraph. Northern Pipe Line Company, Oil City, Pa., was a recent New York visitor.

Mr. Hugh M. Wilson, vice-president of the McGraw Publishing Company, New York, has resigned that position to devote himself to personal interests. Mr. Wilson is well-known in railroad circles and as a journalist.

Mr. Samuel Reese, former manager of the Western Union office at Cleveland, Tenn., and Mrs. Reese, celebrated the fiftieth anniversary of their wedding on December 23, last. They received the congratulations of many friends and neighbors. Mr. Reese retired as manager of the Cleveland office four or five years ago.

Mr. C. R. Hudson, a leading statistical expert on Latin-American railroads, has resigned his position with the National Railways of Mexico to become vice-president and general manager of the Cuba Railway, at Camaguay, Cuba. He is a native of Kansas and like many other prominent railroad officials started his business career as a telegraph operator. He worked on the Atchison, Topeka and Santa Fe road for several years as operator and in other capacities.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. Edward Reynolds, vice-president and general manager is visiting Southern Division offices and will be absent a few weeks.

Mr. G. W. Ribble, district superintendent, Atlanta, Ga., has been appointed general superintendent, with headquarters at the same point, vice G. H. Usher, deceased. The appointment will become effective February 1.

Managers Appointed.—Miss M. W. Evans at Newark, Ohio; E. Kapp at Fostoria, Ohio; T. J. Lovett, Adrian, Mich.; D. R. Sandford, La Fayette, Ga.; A. O. Horton, Owosso, Mich.; O. H. Burlingame, Ann Arbor, Mich.; W. E. Clarke, Garden City, Kan., vice H. E. Daniel, resigned; C. B. Castles, Quitman, Ga.; H. F. Boyce, South St. Paul, Minn.

Mutual Investment Credit Union.—The annual meeting of the Mutual Investment Credit Union of New York City will be held at 253 Broadway, New York, January 16. Directors and members of the committee will be elected.

In Favor of the Postal Company.—In a recent issue reference was made to the conviction of the Postal Telegraph-Cable Company for violation in Butte, Mont., of the statute of that state forbidding the transmission of information that should be used as the basis of pool room bets on horse races. The case was taken to the state supreme court and that tribunal has reversed the decision of the trial court, on the ground that the evidence upon which the telegraph company was convicted was insufficient to sustain the judgment. The judge of the trial court was very severe on the company and openly stated that he only regretted that he could impose a certain fine. The judge was defeated for reelection, owing, undoubtedly, to his bias, and his decisions have been reversed by higher courts, which is a sad commentary on justice.

Magnetic Club Election.

At the annual meeting of the Magnetic Club held in New York, January 11, the following officers were elected for 1917: President, Charles C. Adams; vice-presidents, John J. Whalen, Welcome I. Capen, Minor M. Davis; secretary, William B. Dunn; treasurer, Joseph J. Cardona. Governors, Charles Shirley, Daniel F. Mallen, Frank E. McKiernan and James J. McDermott.

The thanks of the club were extenled to Mr. Edward Reynolds for his effective work as president during the past year and he was elected an honorary member.

Resolutions of sorrow were passed upon the death of George H. Usher, of Atlanta, Ga., a former president of the club.

The club now has 245 active members and eight honorary members.

Government Ownership's Advocate Defeated.

The Postmaster-General in his annual report just issued repeats his recommendation for the government ownership of the telegraphs and telephones, but we presume he merely does it for the sake of consistency, because his recommendation does not contain the fire or enthusiasm of former years.

No doubt his ardor has been dampened somewhat by the defeat of "The Gentleman from Maryland," the Hon. David J. Lewis, the Lord High Advocate of Government Ownership of the Telegraphs and Telephones, who essayed to run for United States Senator from Maryland in the recent election. Mr. Lewis was defeated on the Democratic ticket by a substantial majority, despite the fact that President Wilson, running on the same ticket, carried the state. Mr. Lewis advocated government ownership of the telegraphs and telephones. Mr. Wilson did not. That tells the tale.

Considering the mounting cost of paper the country is saved considerable by the defeat of Mr. Lewis, because if any man seemed bent on filling up the *Congressional Record* with empty words it was this self-same Mr. Lewis.

The people won't be buncoed any longer with this government ownership stuff, because they know it is not the real thing, and whenever they get a chance at such as Mr. Lewis they generally put them back where they have no chance to exploit their quack reforms at the public expense.—*Postal Telegraph.*

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Official Trip to California.—Messrs. Newcomb Carlton, president; L. McKisick, assistant to the president; W. N. Fashbaugh, vice-president, Traffic Department; G. M. Yorke, vice-president, Plant Department, and E. Y. Gallaher, vice-president, Accounting Department, left New York, January 8 on an inspection trip to San Francisco, Cal. They will return to New York about February 2. On their way out and back they will stop at various points and will be met by officials of the different divisions.

Mr. J. C. Willever, general commercial manager, Mr. T. W. Carroll, general manager of the Eastern Division and Mr. S. B. Haig, division traffic superintendent, New York, have returned from a business trip to Washington, Pittsburgh and Buffalo. Mr. Carroll left on January 9 for a trip to Boston and other points in the East to be absent a week.

Mr. W. H. Baker, former secretary of this company, has returned from New Orleans and Galveston where he spent the past month on a pleasure trip.

Mr. C. H. Carroll, acting superintendent, has been appointed district commercial superintendent, sixth district, Southern Division, with headquarters at Charlotte, N. C.

Visitors.—Among recent executive office visitors was A. L. Winn, division supervisor of lines, Southern Division, Atlanta, Ga.

A Tribute to the Memory of the late G. H. Usher, general superintendent of the Postal Telegraph-Cable Company at Atlanta, Ga., has been received from the Atlanta staff of this company. Mr. Usher was highly regarded by all who knew him.

H. C. Chace, former division traffic superintendent at San Francisco, was tendered a farewell dinner at the Hotel Stewart in this city, December 19, on his departure to take up his new duties at Topeka, Kan., as superintendent of telegraph of the Santa Fe System. Assistant manager J. G. Decatur acted as toastmaster. Laudatory remarks were made by Messrs. F. H. Lamb, R. E. Mulcahy, M. T. Cook, A. H. May, Hugh McPhee, H. J. Jeffs, R. H. Miller, W. F. Schwandt, H. E. Dodge and B. L. Brooks. Arthur W. Sine, who will become assistant superintendent of telegraph of the Santa Fe System, also received many complimentary references.

Edward Boening, former district commercial superintendent at Seattle, Wash., was tendered a farewell dinner by a number of his associates in the second district, Pacific Division, at the Washington Hotel, Seattle, December 2. W. J. Smith, manager of the Seattle office, acted as toastmaster. Appropriate remarks were made by I. N. Miller, Jr. (who succeeds Mr. Boening as district commercial superintendent) and others. There were twenty gentlemen present.

E. A. Beardslee, aged seventy-two years, former manager at Los Angeles, Cal., died in that city December 31, last. He was connected with the Western Union Company for more than fifty years, twenty-five years of which he was commercial manager at Los Angeles. Previous to that time he was identified with the telegraph service in the New England states. He was retired on pension four years ago.

Morse Electric Club Election.

The annual meeting of the Morse Electric Club took place at 195 Broadway, New York, on January 10, and the following officers were elected for the ensuing year: President, G. W. E. Atkins; vice-president, W. N. Fashbaugh (re-elected); and the following new vice-presidents: J. C. Willever, E. Y. Gallaher, G. M. Yorke; secretary, W. C. Merly (re-elected); treasurer, R. J. Murphy (reelected). Members of the board of directors re-elected are H. W. Ladd, Gardner Irving, P. J. Casey and the following new members, the board being increased from six to eight: J. W. Connolly, R. E. Chetwood, L. McKisick, J. F. Nathan and L. C. Boochever.

The by-laws were amended to provide for four instead of two vice-presidents to serve for a term of one year, and for eight instead of six directors.

A committee was appointed to arrange for a dinner to take place the early part of February.

C. R. Fisher, Division Traffic Superintendent, Denver, Col.

Mr. Charles Raymond Fisher, of the office of the vice-president in charge of traffic, New York, who has just been appointed division traffic superintendent, at Denver, Col., was born at Three Rivers, Mich., August 10, 1876. He entered the telegraph service in Chicago in 1891 as check boy for the Western Union Telegraph Company. He soon qualified as an operator and was later transferred to the Kansas City office, where he became night quadruplex chief. He returned to Chicago to become a wire chief but was again transferred to Kansas City as night wire chief. He was appointed assistant chief operator of the Kansas City office June 1, 1913, and district plant superintendent at St. Louis, October 1, 1910.

C. R. FISHER.

In August, 1911, he was transferred to Denver where he held the positions of district plant superintendent and division wire chief. From this latter position he was transferred in July, 1914, to the head office at New York, where he remained until the time of his late appointment.

Earnings Report for 1916.

The earnings report of the Western Union Telegraph Company for the year 1916, compared with the figures for the year previous, are shown in the following statement:

	1916	1915
Total revenues	$63,632,295.00	$52,475,721.00
Maintenance Repairs and reserved for depreciation	$ 8,711,914.00	$ 8,554,018.00
*Other operating expenses, including rent of leased lines and taxes	41,071,112.00	32,418,523.00
Total expenses	49,783,026.00	$40,972,541.00
Balance	$13,849,269.00	$11,503,180.00
Deduct interest on bonded debt	1,331,850.00	1,335,588.00
Net income	$12,517,419.00	$10,167,592.00

* Includes special payments to employes in December, 1916.

Dinner to Milwaukee Messengers.

In the evening of December 28 forty-five messengers of the Western Union Telegraph Company at Milwaukee, Wis., were entertained at dinner by the company, represented by Manager F. A. Mohr.

They marched from the main office to the Blatz Hotel, where the dinner was held, and attracted much attentioin. In the centre of the dinner table was a Christmas tree lighted by small electric lights and the boys had an enjoyable time.

After the dinner Mr. Mohr gave the boys a talk on "The Importance of a Messenger to a Telegraph Company," telling them that they were an important cog in the big machinery of the Western Union, inasmuch as they started the message on its way, by collecting it, and later delivering it, and anyone who started anything and always finished it was a big man in any business. He told them how they entered in all the big transactions of the business world, how they delivered messages of congratulations, of promotions, of sickness and death, and about the importance of all messages, and asked them to use every care in making prompt deliveries, as the patrons of the company expected prompt service, otherwise they would not use the telegraph.

Every opportunity was offered them for learning the business, he said. A telegraph school would soon be opened, and he urged them to have some object in view and to work hard to attain it. He also spoke about the healthy occupation of a messenger in the open air.

Messenger Eric Jordan spoke for the messengers, and thanked Mr. Mohr and the Western Union Company in a very able manner. He was followed by Mr. George Geisler, chief delivery clerk, who gave the boys some very good advice.

The meeting then adjourned, and the boys marched to the *Milwaukee Sentinel* and *Free Press* offices, where they gave their messenger yell, and disbanded at 8:30.

Those present besides the messengers were: Charles Salb, assistant manager; George Geisler, chief delivery clerk; Fred. Bierbach, call clerk; Richard Coogan, assistant delivery clerk; Arthur Haak, route clerk, and George Luepe, copy clerk.

Dinner to Retiring and New Presidents.

At a meeting of the Board of Directors of the Serial Building Loan and Savings Institution held in New York on January 11 it was decided to give a dinner at which the retiring president, Mr. Ashton G. Saylor, and the newly elected president, Mr. Thos. W. Carroll, would be the guests of the evening. It will be held at a date to be fixed about February 15, at which both lady and gentlemen members of the association will be present. The place of holding the dinner and the details have been referred to a committee consisting of Messrs. M. W. Rayens, C. A. Kilfoyle, R. J. Murphy, W. J. Quinn and M. J. Kenna. More than one hundred members of the association have already signified their intention of being present.

THE CABLE

Heavy Increase in Pacific Cable Business.—The report of the Pacific Cable Board for the year 1915-16 shows that the excess of receipts over expenditure was $129,600 greater than in the previous year, and this is the first occasion on which there has remained a surplus from revenue after payment of the sinking-fund annuities. All the cables have been worked continuously at high pressure, the long sections carrying far more traffic than was originally expected; they are now occupied day and night throughout the week. During the year, nearly eight and one-quarter million paying words were transmitted over the cable, much more than double the traffic during the last normal year (1913-14). There was also a considerable quantity of non-paying matter. The Board also carried nearly two million paying words between Australia, New Zealand, and the Pacific Isles. The deferred traffic was more than doubled, and the week-end traffic more than trebled, as compared with the previous year, but ordinary traffic decreased thirty per cent., owing to the restricted use of codes. The cheap services had to be suspended on certain occasions owing to interruptions in the Atlantic cables and congestion of traffic, and the outward week-end and deferred press services are at present in abeyance, but will be reinstated as soon as possible.

John D. Trenor, age sixty-nine years, who died in New York on January 2, was prominently identified with the sugar interests. He was also prominent in cable circles in the early seventies. Mr. Trenor was born in Bristol, England, and came to New York in 1872. He retired from active business some years ago.

As a cable operator Mr. Trenor had a varied and interesting experience. He was official cable operator to General Kitchener during his Egyptian campaign, accompanying him to Khartoum. He had several letters from General Kitchener complimenting him on his services. He was also stationed at Malta and later was cable agent at Naples, Italy, where he remained for some time. During the first Roosevelt presidential campaign he toured the country in the interests of that candidate addressing Italian audiences in their native tongue, which he spoke fluently.

When the question of changing from the Morse to the continental code was agitated in the middle seventies President Orton of the Western Union Telegraph Company invited Mr. Trenor to a conference on the subject. Although Mr. Trenor was a continental operator he advised against the change and no doubt his advice had some influence, as the conference decided to take no action.

Since his retirement from business Mr. Trenor made an investigation of labor conditions in the Balkan states bearing on the immigration problem in America for the benefit of the United States government. For this work he was well fitted by his gift as a linguist.

For several years Mr. Trenor was New York representative of the Hawaiian Sugar Planters Association. He leaves a wife and son.

CANADIAN NOTES.

GREAT NORTH WESTERN.

At a meeting of the directors of the Great North Western Telegraph Company held at Toronto, December 27, 1916, Lieut.-Colonel Frederic Nicholls was elected a director in place of Hon. J. K. Kerr. Colonel Nicholls is president of the Canadian General Electric Company and is also connected with a number of other large Canadian enterprises.

A. D. Campbell, formerly assistant chief operator at Winnipeg, Man., has been appointed chief operator at that point, succeeding B. S. Round, who has left the service.

A. E. Holmes, chief operator at Saskatoon, Sask., has been appointed assistant chief operator at Winnipeg, Man., vice Mr. Campbell.

A. A. Rogers, night chief operator at Saskatoon, has been appointed chief operator at that point and F. F. Yerex, all night chief operator at Saskatoon, succeeds Mr. Rogers as night chief. R. W. Pearsall has been appointed all night chief at Saskatoon.

Leonard Hague, aged twenty-two years, an operator for the Canadian Pacific Railway Company's Telegraph at Montreal, Que., died of pneumonia in that city December 30, 1916.

THE TELEPHONE.

Mr. R. S. Scarburgh, advertising manager for the New York Telephone Company, New York, has resigned, to take effect February 1, to go into other business. He will be succeeded by Mr. W. F. Crowell.

Telephone Messages in Australia.—The postal authorities of Australia have decided to introduce on trial for twelve months, at the central exchanges in the capital cities, a system whereby if any telephone subscriber is out of call, the telephone operator will take a message and telephone it to the subscriber as soon as he may be available. This is very good but it would not be practicable in large American cities.

RADIO TELEGRAPHY.

ENGLISH MARCONI DIVIDEND.—The Marconi Wireless Telegraph Company, Ltd., London, has declared an interim dividend of 7 per cent. on its preferred shares and 5 per cent. on its ordinary shares. The Marconi International Marine Communication Company has declared a 5 per cent. interim dividend on its shares.

DANCE MUSIC BY WIRELESS.—At a dance at the home of Theodore E. Gaty, in Morristown, N. J., on the night of December 30, the music was supplied by a phonograph at Highbridge, N. Y., about forty miles from Morristown, and transmitted by wireless. The phonograph was played in the Highbridge plant of the De Forest Radio Telephone and Telegraph Company and the faint waves as received were amplified by the use of an amplifier and heard very distinctly in the house. The amplifier used on this occasion is the invention of Dr. Edwin H. Armstrong, of Columbia University.

THE *Marconi Service News* for January is full of interesting matter for Marconi people, and radio employes in general. It is artistically and tastefully gotten up and contains articles and items of general interest. On the front cover is a New Year's greeting from Mr. E. J. Nally, vice-president and general manager of the company.

RADIO ENGINEERS.—At the meeting of The Institute of Radio Engineers, held in the Engineering Societies Building, New York, January 3, Mr. Robert H. Marriott presented a paper on "United States Radio Development."

Opposed to Radio Control by Government.

In a statement given out January 3 by Mr. E. J. Nally, vice-president and general manager of the Marconi Wireless Telegraph Company of America, in regard to the proposed government monopoly of radio communication Mr. Nally says:

"Government control will tend to hamper the art of radio communication, for the government has not the stimulus of commercial competition, and the hope of individual reward, and it is prone to take present accomplishments as finalities. The Marconi Company vigorously protests against the proposed legislation not only because it will effectively stifle the growth of wireless telegraphy but because it amounts practically to the confiscation of private interests, and besides, it is against the established principle of the American nation which has heretofore allowed free scope for all work and especially work of an experimental nature."

Mr. Nally says that there are already ample laws and regulations on the statute books giving the United States government the necessary power for absolute control of all radio stations in times of war or public peril.

"Government monopoly of wireless telegraphy," says Mr. Nally, "would be far more hurtful in its effect on the development of the science than can be imagined by persons not directly connected with the wireless art and not familiar with its previous history.

"For nearly twenty years Mr. Marconi has been steadily developing the art and it has taken all this time to get it in a state to make commercial success possible. In spite of this Secretary Daniels proposes that 'The Committee provide for the purchase of all stations used for commercial purposes' without taking into consideration all that has been expended in work and in money during all these tedious years to bring about the high development necessary to equip the modern station and also irrespective of the value of those stations as a necessary part of the radio communication business.

"Again, Mr. Marconi is an alien and the bill undertakes to shut out 'Any company of which any officer or more than one-third of the directors are aliens or of which more than one-third of the capital stock is owned or controlled by aliens.' Another result of it would be to deprive this country of the benefit of Mr. Marconi's future inventions. The proposed discrimination against aliens is in contravention of the laws of nations and would quickly cause other countries to retaliate in kind. For example, all of the cable companies of this country are dependent upon foreign countries for landing rights, and England could say to the Western Union and to the Commercial Cable companies that because they are controlled by aliens they are not entitled to do business in England.

"The Marconi Company maintains that the government in times of peace should not go into wireless telegraphy business; that in times of war its commercial stations will be placed at the government's disposal.

"Finally," says Mr. Nally, in conclusion, "if the government takes over the operation of the nation's radio service it is only a step to federal operation of the telephone and telegraph systems of the country. Here lies the importance of the radio bill. It is the entering wedge to government ownership in America."

The Study of Wireless Telegraphy.

Probably the first question to come in consideration to those taking up the study of wireless telegraphy would be: what preparation must be had and what kind and type of instruments must be used? In wireless telegraphy, as in the study of any other art, the more preparation we have along that special line the more simplified will be the course. Many have been known to take up the study with no previous experience or knowledge of electricity and are now expert operators. While this cannot be accomplished by all, yet one may rest assured that by careful and close study, a knowledge will be gained that will prove of ultimate benefit whether one intends to follow this as an occupation or not. An experienced electrician could make more rapid steps than one just embarking in the field, for the electrician would have his previous knowledge to draw from which would prove of assistance. In the end, however, the beginner might prove the more able, for such knowledge as he gained would be from his own resources and ability and not from any previous learning. Therefore in wireless telegraphy it is impossible to judge what one can do until they have shown results, but constant work and study, as in everything else, is sure to bring success.

It is absolutely necessary that the student should be able to send and receive messages over the wire line by the Morse code. This, if possible, should be learned by the student before taking up the study of wireless telegraphy. When one has learned how to send and receive over the Morse instruments he may rest assured of his ability to send and receive over the wireless set.

It being assumed that the student has had no previous experience the necessary instruments should constitute a Morse set for learning the code and a short distance wireless telegraph set. If the student has sufficient ability he is advised to construct the set, for in this way he can gain a closer insight into the working details. However, the student may not have the time or ability to construct the set, and if so the whole can be purchased at low cost. Such a set consists of the spark coil, oscillators, etc., at the sending end, and the coherer with automatic de-coherer at the receiving end. The coherer receptor can be replaced with the liquid detector or any other type of detecting device. The main feature of the coherer is that it gives out an audible signal, while with the liquid and other self-restoring types of detectors the signals are read in a telephone receiver by buzzing sounds corresponding to the code. The coherer is also difficult of adjustment, and for this reason is recommended to the amateur, as the adjustment when once made perfect will give an idea of the delicate features involved in the other types.

When a circuit consisting of a condenser, inductance and spark gap is charged by a transformer to a potential so great that a spark passes across the gap, the electricity stored up in the condenser discharges itself through the spark gap, and by its inertia charges the condenser in the opposite sense, only at the next instant to again discharge itself, and so on. All this takes place during the time of one spark, and in fact this surging of electricity is what keeps the spark in existence after the first discharge. This surging back and forth would continue indefinitely were it not for the energy used up in the heat of the spark and in the resistance and other losses in the rest of the circuit. But as no new energy can be introduced into the circuit until the condenser is recharged, the electrical surgings decrease in intensity and finally cease.

If we represent time by the horizontal axis and the amplitude of the oscillations by the vertical axis, we can show graphically the course of the phenomenon. It is exactly analogous to a light pendulum which is set swinging and which is brought to rest after a limited number of swings by the friction of the air.

Gradually decreasing oscillations of this kind are called damped oscillations and obey the law that each succeeding amplitude is a given fraction of the one before it.

If means can be found for keeping up a constant supply of energy, such as an alternator directly connected to the aerial or an arc transmitter, our oscillations can be made to continue indefinitely and with equal amplitude, and such oscillations are called undamped oscillations.

The Associated Press.

The Associated Press, through Melville E. Stone, its secretary and general manager, has applied to Judge A. N. Hand of the Federal District Court in New York for an order permanently restraining the International News Service from using in any way any news gathered by The Associated Press for the sole use of its members.

More Season's Greetings.

Cards expressive of the season's greetings in addition to those acknowledged in the previous issue have been received from J. B. Bertholf, Monroe, N. Y.; J. B. Dillon, wire chief, Western Union Telegraph Company, Little Rock, Ark.; D. Van Nostrand Company, New York; E. I. du Pont de Nemours and Company, Wilmington, Del.; C. R. George, secretary, International Association of Municipal Electricians, Houston, Tex.; Edward B. King of the Western Union Cable Staff, Havana, Cuba; F. J. Howell, Corning, N. Y.; E. E. Bruckner, Chicago, Ill.

INDUSTRIAL.

Selectors in Commercial Telegraph Offices.

On way wires much time is lost in calling the principal offices but this waste will no doubt in time be largely eliminated by the use of selectors. These instruments are very rapidly coming into use in commercial offices, and are proving their worth as time savers. During the past year over one thousand of them were installed in commercial offices, and the fact that their use is rapidly extending is evidence that they are giving satisfaction. This large number of equipments is additional to those installed previous to 1916. These figures apply only to selectors used for telegraph service and exclude those which were installed during the same period for telephone train dispatching and similar uses by railroad companies. One of the selectors employed for this work is the well known Gill instrument, made by the Hall Switch and Signal Company. On account of its reliability and practicability this selector is making rapid progress in all branches of commercial telegraphy where time in calling is to be saved.

The value of the selector in commercial telegraph offices as a substitute for calling was early recognized by Mr. John F. Skirrow, associate electrical engineer of the Postal Telegraph-Cable Company, New York, who in 1906 recommended the adoption of selectors in the Postal service. Mr. Skirrow says that so far as his company is concerned hand calling is now passé. The saving in wire time as well as the services of operators by the use of selectors is very large. It must be remembered that operators in way offices having messages to send have to sit for long periods at a busy wire awaiting a chance to get the circuit to dispose of their business. Now with the use of selectors they can attend to other duties until their office is automatically called.

G-R-S Selectors.

The General Railway Signal Company, Rochester, N. Y., has recently shipped to the New York Central Railroad a G-R-S- selector system, consisting of sixty-nine station equipments, to be installed on the St. Lawrence Division. This system, when completed, will compose three circuits, one of which is now in service. In the G-R-S selector system the method of supplying current is unique, in that the motor-generator set starts and stops for each selector call. In this installation the motor of each motor-generator will draw current from an alternating-current commercial circuit. Six motor-generator sets will be used and so arranged through a control on the switchboard that there will be a complete interchangeability for operating the several selector circuits and the Morse circuits. An eight-foot switchboard is provided, which gives complete control to all apparatus.

Diaphragm Sounder.

The local battery problem is a serious one, especially in railroad offices, and in order to meet it the Railways Labor-Saving Device Company, of Davenport, Iowa, has brought out an instrument that answers the purpose very satisfactorily. It consists of a diaphragm attachment to the relay contact point which augments the sound of the moving armature lever to such a degree that a sounder is unnecessary. The instrument is popular in railroad offices and in other places where trouble with local batteries is experienced, and does its work well. It deserves wider use, as it is a very satisfactory device in practical operation. It is now being tested in connection with wireless work. Its application is limitless and where a telegraph sounder is used this instrument will well take its place.

JESTER-COOPER REPEATER. — The Jester-Cooper repeater, which was described and illustrated in these columns November 16, is now in use by the Postal Telegraph-Cable Company of Texas, the North American Telegraph Company and the following railroads: The Pennsylvania, West of Pittsburgh; Seaboard Air Line; Cleveland, Cincinnati, Chicago and St. Louis; New Orleans, Mobile and Chicago; New York, New Haven and Hartford; Louisville and Nashville; Texas Company, of Texas; the Gulf Pipe Line Company; the Grand Trunk Pacific Railway of Canada, and others.

THE VIBROPLEX COMPANY announces an increase in the price of Vibroplexes from $12.00 to $13.00 for japanned bases, and from $14.00 to $15.00 for nickel plated bases. This increase in price has been made necessary by the advance in prices of all materials entering into the make-up of these devices. The Vibroplex Company has hesitated to announce the advance until this time, when it becomes absolutely necessary to do so. To maintain the old rates would mean a loss to the company or a sacrifice in workmanship. A Vibroplex to be effecient must have careful construction and be made of the very best material to maintain its present high standard. The new prices will go into effect on February 1.

WESTERN ELECTRIC YEAR BOOK.—The 1917 Year Book of the Western Electric Company has just been issued. It forms a volume of 1,312 pages and is complete in every respect. Everything electrical is catalogued—telegraph and telephone instruments of all kinds, electrical devices, motors, generators, switchboards and construction material—and the volume is profusely illustrated with views of typical apparatus, etc. The method of bringing out a year book and thus giving up-to-the-minute information has grown to be quite popular with the purchasers of electrical supplies and equipment, and the uniform list with one basic discount is also another popular feature. The book is artistically and strongly bound.

THE ANNUAL MEETING of the Telegraph and Telephone Life Insurance Association will be held at 195 Broadway, at 4 p. m., Wednesday, March 14. An amendment to Section XIII of the By-Laws will be voted on. It refers to the ascertaining of the causes of death and paying death claims.

BOUND VOLUMES FOR 1916.—Bound Volumes of TELEGRAPH AND TELEPHONE AGE for 1916 are now ready for delivery. The book contains 600 pages and is a complete record of progress during the year in telegraphy, telephony, cable telegraphy, radio-telegraphy and every other application of electricity for the transmission of intelligence. The contents are focused in a complete index and the valuable articles are thus readily available. The price per volume is $4.00 per copy, carrying charges collect.

LUXURIES DOWN, NECESSITIES UP.—Mobile, Ala., has increased the franchise tax on telegraph companies from $150 to $250 per year and reduced the automobile license tax.

Mr. W. O. Snyder, prominent in broker circles in Philadelphia and New York, now living in Bridgeport, Conn., writes: "Enclosed please find remittance covering my thirty-fourth year's subscription. How frequently do you give the AGE an injection of Ponce de Leon's elixir, and in what form does it come? I need at least a case. I notice that in the years I have been with you the AGE continues young, vigorous, full of vim and vivacity and continuously improving, while I am getting old, grouchy, neurasthenic and at present nursing an active volcanic carbuncle nestling charmingly on the topmost peak of my spinal column. Send me the dope how you do it."

Mr. Harry McKeldin, chief operator, Western Union Telegraph Company, Washington, D. C., writes: "My check book fails to show where I have made my annual remittance, therefore am not going to take a chance on losing a copy of the AGE for 'non-payment of dues.' Enclosed $2.00."

Mr. H. E. Edwards, manager, Western Union Telegraph Company, Nelsonville, Ohio, in remitting to cover a renewal of his subscription writes: "Thank you for renewing same. I could not get along without the AGE. Yours for success."

The Christian Religion and the Morse Telegraph.

BY WALTER P. PHILLIPS

For the past year, or more, I have been devoting myself to the recovery of my health and to a careful observation of the friendly warfare between the Morse telegraph and the page and line tickers such as the Morkrum and its predecessors. Before Christ came there was no religion in the world that amounted to anything worthy of mention and the same is true of the primitive telegraphs up to the time that Morse made his invention known to his friends. The religions, so called, that have sprung up in the last two thousand years have amounted to nothing compared with the teachings of Jesus and their only merit has been that they were founded, in most cases, on the teachings of the Nazarene. Such of them as were not have found no permanent lodgement in the hearts of men. All of the telegraphs that have been successful in a large way have been based on the Morse system—the Wheatstone, the Edison, the Delany, and others all of which have their advantages over hand sending, particularly in respect of the utilization of wires to a much greater capacity than is possible with any printing telegraph yet devised by the many ingenious inventors who have contributed their share toward the desirable end in view. This is particularly true of Messrs. Wright, Cardwell, Buckingham, Rowland, Barclay and Krum. And yet with all the striving for a satisfactory measure of progress, the exhibition of no end of mental energy, the display of great ingenuity and the expenditure of vast sums of money the printing telegraph of to-day, as applied to circuits of any considerable length, is just where it was when I saw the beginning of its end more than fifty years ago. The early printers handled press reports, at the rate of from 1500 to 2500 words per hour and regular messages at the rate of sixty five per hour. Can any of the printing telegraphs of to-day excel that old record of more than half a century ago? Excepting on short lines, where high speed is not essential, and for the distribution of news in cities as a substitute for messenger service, the increased speed of the page and line printing machines does not compare favorably with the synchronous system of George M. Phelps which combined the most meritorious features of the Hughes and the House printers.

Two years, or so, ago, addressing Wesley Russel then of Chicago and the editor of the *Commercial Telegrapher's Journal* now connected with the brokerage house of Jones and Baker of New York, I said, in part:

> Of course you and I believe that telegraphing can be done more cheaply by Morse than in any other way. These printing systems have been failures from the beginning. Compared with the Hughes, House and Phelps printers these step by step machines are the crudest things imaginable. The old time printing telegraphs were as fine as Howard watches and were operated by a synchronous action that was perfect. But all are gone and for the simple reason that their use was not economical.

On the three systems referred to, the House, Hughes and Phelps was established the American Telegraph Company which was not permitted to use Morse until it purchased the New England Union Telegraph Company in 1860. At that time and for six years the American was the largest telegraph company we had. It used both the Morse and printing systems and though it was founded on the latter and owed its very existence to Hughes and House the more economically operated Morse system superseded it, by degrees, as the years flew by. In 1866, when the American Company's great rival in eastern territory—the United States Telegraph Company—headed by William Orton, as president, joined with the Western Union, the American Telegraph Company also gave in its adhesion and Mr. Orton became president of the combined organizations, very few of the printing telegraph instruments were in use and all were worked out of the New York office—to Boston, Philadelphia and Washington. Gerrit Smith invented and patented a duplex and everything was done to save the beautiful system for yet a few years longer. It is now as dead as Caesar and its only offense was that its use increased slightly the cost of handling messages. That is the crucial test in the final analysis—the prime cost of labor and material in producing any given result.

I was told, yesterday, that it was estimated that at the rate things were going in New York there would be no employment for Morse operators in three years from now. I fell to humming Foster's song, sung by my father sixty years ago, when I was a boy.

"Weep no more my lady,
Weep no more today,
We'll sing one song for the old Kentucky home,
The old Kentucky home far away."

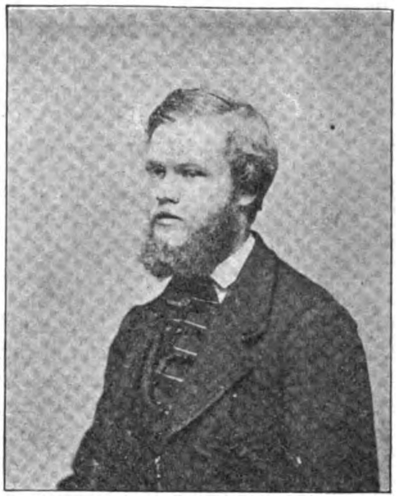
I have been hearing this ever since the appearance of step by step printing telegraphs. What has become of the Essick, the Linville, the Burrell and all the others? But the Morse is a thing so simple, accurate, economical, instantaneous and admirable that it seems as if God must have whispered in Professor Morse's ear "Here is something so necessary to the welfare of my people that I choose you, my son, to give it tangible expression and present it to them that they may have the benefit of its use through all eternity"—this obvious gift of the Father abides with us in perfect and unfading flower at the end of seventy years. But at the end of another three years the telegraphing is to be done exclusively by those who can live on less than eight hundred or a thousand dollars per year. To such is to be entrusted the nervous system of the commercial anatomy. Don't you believe it. The natural movement of the world is onward but occasionally, through some contretemps, civilization gets a setback. But always there is a net gain. Every century brings us nearer to perfection. There would be a net loss if a God-given thing, as glorious as speech and song, as music by violin or organ or as uplifting as the work of Corot or Michael Angelo—there would be a net loss if the perfect inheritance from Morse were to be replaced by the noisy, inaccurate, illogical successors of the absolute failures of Essick, Linville and their numerous followers. "Let not your heart be troubled. Neither let it be afraid." Only that which is good can permanently survive. The Morse telegraph system is good and all of the rival systems beginning with the Bain, which, however, was not a printing telegraph, and including the House, Hughes, Phelps, Essick, Linville and Rowland, have come with the fascinating appeal of new things and their promoters like "the vain man dressed in a little brief authority," of whom Shakespeare speaks, have played their fantastic tricks before high heaven to make the angels weep, and to quote the Bard once more: "They strutted their brief hour upon the stage and then were seen no more."

Meanwhile, for more than fifty years, the struggle to dim the fame of Professor Morse by supplanting his telegraph with something else has gone on above his grave. Is there any other conclusion to be drawn than that God has been on his side? Meantime, whether you believe with me that God is all, or hold to some modified opinions on supernatural subjects, we can agree, at least, that it is probably true of the inventor of the telegraph that "after life's fitful fever he sleeps well."

The most practical of all the accelerated Morse systems that I have seen in operation is the Wheatstone, but it has its defects and these I have endeavored to remedy in the Morse-Phillips high speed telegraph. The sending operator does his work with a Morse key or with Mr. Martin's most ingenious and excellent device known as the vibroplex. Though the matter may be passed over the line at the rate of one hundred and twenty messages per hour, or much more, the receiving apparatus makes a physical record from which the signals can be reproduced at a reduced and comfortable rate of speed. Every dot can be read by sound as the matter goes out and every signal can be read by sound at the rate of speed mentioned when it comes in. If desired two hundred messages and upward per hour can be transmitted by my system and a physical record made at the remote station which can be slowed down in the reproduction and read by sound the same as if the matter had come over the line at an ordinary gait. The defect—the great drawback in the Wheatstone—is that the signals must be read by sight instead of by sound.

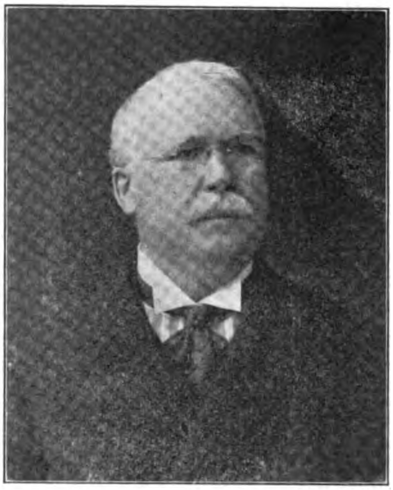
The weakness in the printing telegraphs, today, as it has always been, is that they have no capacity for more than the usual speed attained in regular Morse transmission and receiving by sound, viz: from fifty to seventy-five messages per hour. This is a high average for experts both with the Morse and the Morkrum. Greater experts such as McClintic, Conkling, Brickhouse, Gibson, Bruckner and a few others achieve a hundred messages per hour. The Rose Fritzes of the Morkrum are equally successful in their field. But the average of the ordinary senders does not go above sixty messages per hour and my system will double that in a walk, and multiply it from three times and upward if its gait is forced. While the signals would carry all right they could not, of course, be read by sound when they were sent nor when they were received without being slowed down in the reproducer to the normal point. But in the meantime they have gone over the line like a streak of greased lightning and the carrying capacity of the wires would be doubled or trebled. Does any printing telegraph, past, present or future, increase wire facilities after this fashion and to an equal extent? If the reply is made that the printing telegraphs are duplexed, quadruplexed, or divided into "channels," my rejoinder is that I can work on any circuit that any one else can work on and attain a rate of speed that will put the printers to the blush. I am going to build and market my machines, selling them outright at reasonable prices. Telegraph companies, renters of private wires, railroads and all others, please take notice.

GERRIT SMITH.



FRANKLIN LEONARD POPE.

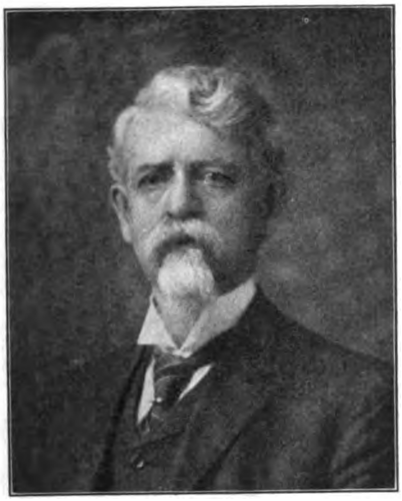
Relative to my contention repeatedly asserted and reiterated that the number of Morse operators would increase instead of diminish my information is that my prediction has come true. The proportion of telegraph business done by the Morse system, today, is eighty per cent. and that percentage is as high as it has been in the past quarter of a century. Fifty years ago, when one of the competing telegraph companies used the printing telegraph exclusively, the Morse proportion was less than one half. It has surely been a case of the survival of the fittest.



PATRICK B. DELANY.

Printing operators, many of whom became men of affairs took up the study of Morse years before the House-Hughes-Phelps Combination printer—duplexed at that—was forced to the wall. Among these were George B. Prescott, Gerrit Smith, Franklin Leonard Pope, Patrick B. Delany, Henry Denver, Nelson D. Pratt, John E. Selden and others. They had compared the advantages of the Morse system with those of the printing telegraph and they made their choice with their eyes wide open and after years of observation and study. The printing telegraph of earlier days, died a lingering death and most of its operators who did not master the Morse system passed off the scene and their names were no longer spoken of men. Some, however, became the heads of departments outside of the operating room. Moses S. Roberts, for example, was prominent in the bookkeeping department, John C. Hinchman was made superintendent of the Metropolitan District of the American Telegraph Company, Martin Van Buskirk Finch was made manager of its New York office, J. W. Stancliff manager of the Morse lines at Hartford, Henry Denver at Springfield and Henry C. Bradford at Providence. A. A. Lovett was raised to the superintendency of the New England lines and W. F. Richards was appointed manager of the consolidated lines at Boston. James N. Ashley became the editor of *The Telegrapher* and on being invited to take charge of *The Journal of the Telegraph* on very liberal terms he stopped his own paper. Among those early operators of the printing telegraph were also Rufus B. Bullock and Marshall Jewell, whilom governors of Georgia and Connecticut, respectively. I mention these facts to show that all the telegraphers of these old incomplete days had that within which passeth show. These and many of their associates were men of great ability and high standing in the communities in which they dwelt. They saw the value of what the devotees of Morse had brought to the front. They were able men, as I have intimated, resourceful and ambitious as was shown by the fact that Prescott became the electrican of the Western Union Telegraph Company; Hinchman, Roberts and others were advanced to positions of trust and satisfactory emoluments or found lucrative work for their hands to do in other realms of human effort. If men as those I have mentioned could not make the printing telegraph a success, in 1850-1880 how can the present complicated and expensive system with extremely uncertain results, up to date, supersede or in any marked way impair the usefulness of the simple dependable Morse telegraph which calls only for men of intelligence and skill—human beings worthy of their hire—calls only for willing hands and alert minds to keep it permanently in the field, with no opposing force to speak of from the Morkrum in the hands of the young and charming, whose education and present improving environment tends to make them more than normally attractive in the eyes of their brothers and to give them the pleasing prospect of prompt marriages followed by their eventful departure to take up new and higher duties. Their places will be filled with increasing difficulty for the peach crop has its limitations in all parts of the world.

(To be continued)



HENRY DENVER.

NELSON D. PRATT.

JOHN E. SELDEN.

Working Single Circuits in Bad Weather.

Dry air and glass being insulators, it may be assumed that under favorable weather conditions the perfect insulation of the line at the different points of support is assured, and that the line wire forms the only path for the current. If the circuit be broken at any point along the line under these conditions, the cores of each relay in the circuit will be immediately demagnetized, and so long as the insulation remains constant there will be no necessity for readjustments.

In damp, foggy or rainy weather, however, the poles and glass insulators become coated with moisture, and, water being a conductor, a new path is opened to the current at each support, as shown in Fig. 1.

The resistance of the wire itself is not affected by the weather, and the line still forms the easiest path for the current, but though the separate resistances of the paths formed by the moisture may be very high it must be remembered that these circuits are all derived circuits, and that the current divides at each insulator inversely as the respective resistances of the line and derived circuits beyond, and the short leakage circuit down the pole to ground. The resistance of the whole circuit is greatly reduced by the large number of parallel circuits introduced and the output of current from B and B^1 (Fig. 1), increased in proportion, causing a greater attractive force between the relay cores and armatures, but, while each relay will respond promptly to the opening of its own key, neither R nor R^1 will, on a normal dry weather adjustment, respond to the opening of the key at the distant station. The reason of this is that when K^1 is opened, as in the figure, the circuit of battery B is not broken, but is still completed through the derived circuits, and, while a break at station Z cuts off B^1 from the circuit and causes a still further diminution in the current in R, owing to the greater resistance of the derived circuits, which now form the only paths to the ground, still the magnetism excited in R by the leakage currents alone are sufficiently powerful to overcome the retractile force ordinarily exerted by the armature spring, and the relay remains closed when it ought to respond to the broken circuit at Z.

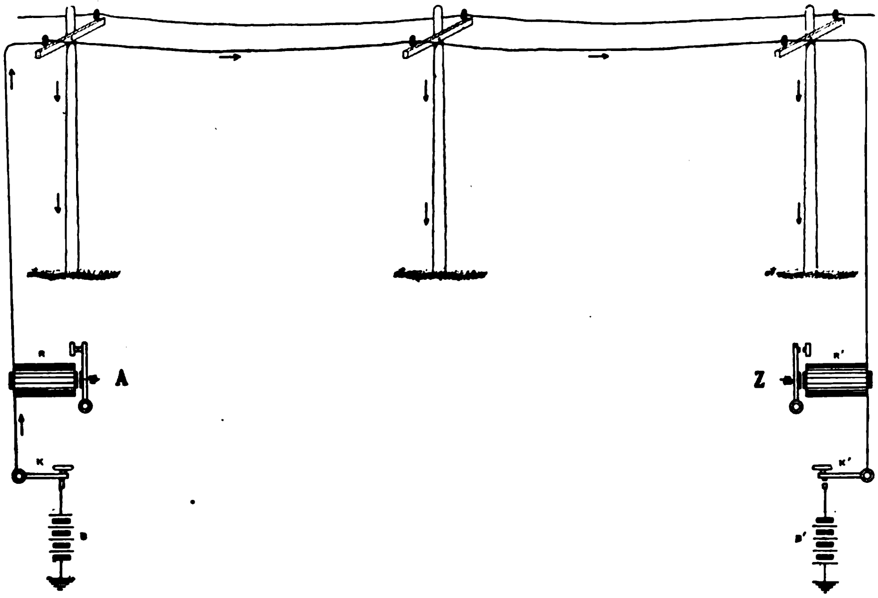


DIAGRAM OF A LEAKY CIRCUIT IN BAD WEATHER.

Unless, therefore, the sending operator is on the lookout at such times, he may be perfectly unconscious of any change, and will continue to send his business until advised via another route to see to his adjustment.

In order to get the distant station's signals under such circumstances it is necessary to withdraw the magnet poles from the armature, and to perhaps pull up a little on the armature spring until the tension of the retractile spring overcomes the pull of the magnets and opens the relay.

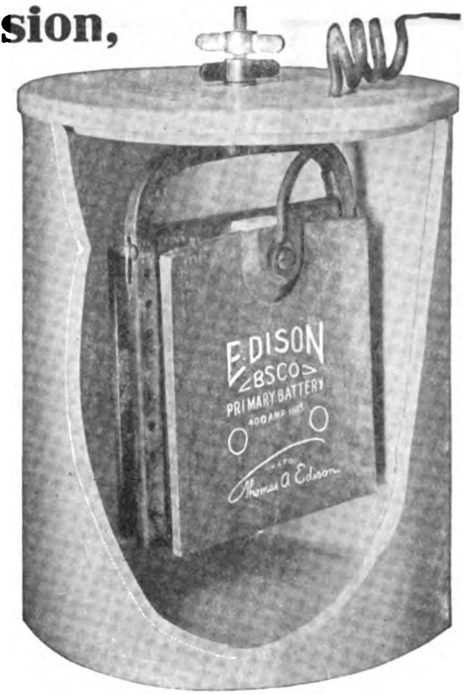
On this high adjustment the relay at A responds to the closing of the distant key on account of the consequent decrease in circuit resistance and the addition of the distant battery to the circuit, whereby the current strength in R is increased, and opens because Z, by opening his key, cuts off his battery from the circuit and forces the current from B to find ground through the higher resistances offered by the derived circuits.

These increment currents represent the only working margin for the operation of the relay, and it will be evident that when the loss on the line is considerable, they will possess but little strength, and produce comparatively small effects upon the receiving relay, which is not then so susceptible to their influence as under ordinary working adjustment.

EFFICIENCY OF ELDERLY MEN.—Tests of the efficiency of men between the ages of forty-five and sixty-five alongside of an equal number of young men, have been started in Chicago by a committee of fifteen large employers recently organized.

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

Type 403 400 Ampere Hours Capacity

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result of experience

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THE RAILROAD.

The Work of the Association of Railway Telegraph Superintendents.

Mr. M. H. Clapp, president of the Association of Railway Telegraph Superintendents, is giving close and active attention to the planning of the work for the next convention of the association which will be held in Washington, D. C., September 18, 19 and 20. He has appointed all of the committees, both outstanding and special, and has written a letter of instructions to the chairmen of all the special committees and the chairmen of the membership and entertainment committees outlining the work that he thinks they should take up this year.

Relative to the work of Committee No. 1, Construction and Maintenance, Outside Plant, of which Mr. Clapp is chairman, he has appointed the following sub-committees:

(a) Wire Crossing: G. A. Cellar, chairman; R. E. Chetwood, L. S. Wells, E. A. Chenery.

(b) Transpositions: R. E. Chetwood, chairman; G. A. Dornberg, E. A. Burkitt, E. W. Day.

(c) Underground: L. S. Wells, chairman; E. W. Day, G. A. Dornberg.

(d) Pole Lines: M. H. Clapp, chairman; G. A. Cellar, E. C. Keenan, J. J. Ross, J. McMillan, W. J. Rooney, J. W. Fry, E. D. Hubbard, C. W. Fraher.

These sub-committees will each report on the branches of the work as indicated by their titles.

The Wire Crossing Committee will keep in touch with the general situation in the United States relative to the matter of proposed specifications and instructions for the construction of wire crossings of all kinds across railroad rights of way, tracks and telegraph lines. It is intended to give special attention to Circular No. 54, Bureau of Standards, National Electric Safety Code, which has been recently issued, with a view of being able to make definite recommendations to the Bureau of Standards in connection with its code. As president of the association Mr. Clapp has appointed a special committee, of which Mr. W. P. McFarlane, of the Chicago & Northwestern, is chairman, to keep in touch with the wire crossing situation in Nebraska and he expects to appoint other special committees if necessary in other states where the railroad commissions or other regulation bodies take up this matter of wire crossings.

On the subject of transpositions a report is expected to be made that will be in detail and reasonably complete.

On the subject of underground, the specifications presented at the St. Paul meeting last year will, it is expected, be put in final form for adoption by the association.

On the subject of pole lines it is planned on making a beginning in the compilation of specifications for the construction of pole lines for railroad purposes. These specifications will be based as far as practicable on Circular No. 54 of the Bureau of Standards.

President Clapp has had correspondence with Mr. L. F. Loree, chairman of the sub-committee of the executive committee of the American Railway Association, relative to the co-ordination of the work of the Association of Railway Telegraph Superintendents with that of the American Railway Association. He has outlined in considerable detail to the American Association the purposes of the association of which he is the head, the work that it is endeavoring to do and the advantages of the two associations working together as closely as practicable. He expects by the time of the Washington meeting to have something definite to report on this subject.

H. C. Chace, Superintendent of Telegraph, Santa Fe System.

Mr. Horace C. Chace, division traffic superintendent for the Western Union Telegraph Company at San Francisco, Cal., who has just been appointed superintendent of telegraph of the Santa Fe System, with headquarters at Topeka, Kan., was born at Santa Cruz, Cal., July 2, 1872, and educated in the public schools in that city. He entered the telegraph service in his native city in 1885 and filled positions successively as operator, manager and wire chief at different points in the West and on the Pacific Coast for the Western Union Telegraph Company. In 1902 he became manager and assistant superintendent of telegraph of the Atchison, Topeka and Santa Fe Railway, with headquarters at Los Angeles, Cal., later receiving the appointment of division traffic superintendent of the Western Union Company at San Francisco. This position he has just relinquished to again enter the railway service.

H. C. CHACE.

Visitors.—Among recent New York visitors were Frank G. Adams, circuit manager, Baltimore and Ohio Railroad Company, Baltimore, Md.

Mr. Arthur W. Sine has been appointed assistant superintendent of telegraph of the Santa Fe System, with headquarters at Topeka, Kan. Mr. Sine has been with the Western Union Company for twenty-seven years on the Pacific Coast in various capacities and occupied the position of division traffic engineer at the time of his latest appointment.

Fletcher C. Rice, aged seventy-two years, general inspector of transportation Chicago, Burlington and Quincy Railroad, who died in Chicago, December 22, started his business career as a telegraph operator on that road and was continuously in the employ of that company until his death. He was the first one in the United States to run trains under signal indications without orders.

Shop Talk.

BY THE OBSERVER.

The Western Union Telegraph Company has expended much money in the preparation of specifications and various diagrams to better prepare every member of its large body of employes for better service.

Better service can only be obtained by the co-operation of every employe, hence it is, I hope to point out in this and other articles to follow, how we may contribute our best efforts, and when that is done, the service desired will result.

Those whose duties require that they familiarize themselves with the rules and guidance of the specifications, can and should devote a little study at home, because where there is nothing to detract our attention, better and quicker learning will follow. Certain it is that there is little time to study during office hours for we are sure to neglect something when we attempt it; besides we would study in an abstracted manner and that is almost, if not wholly worthless. The "old timer" and many others holding the better positions used the midnight oil; therefore why not we.

For the operators and clerks throughout the operating room, circular letters and local bulletins are displayed. These should be carefully read and obeyed. With the foregoing preface let us start at the beginning of the day. All have a certain time to report and should be ready for duty on time. Suppose that the entire force should arrive late. Quite a calamity you say.

Yes, it would be, therefore remember if you are late, others may be and such a calamity might happen. If you were late five minutes each day for the three hundred and thirteen days, that would equal three full days of nine hours. The abuse of short relief privileges may be figured accordingly, hence many dollars worth of time will be wasted throughout the year, due to late arrivals and too much time taken on "shorts." Think over this seriously and do not think your superior officer is a tyrant if he insists upon a proper regard for time.

(To be continued)

News Service and Telegraphs in South America.

Mr. James Carson of the Chicago office of the Associated Press recently completed a tour of the Latin-America countries in the interest of the service. He found everywhere an eager desire on the part of newspaper publishers for a closer relationship between the press of the southern and northern countries but the high tolls and monopolistic concessions granted to English telegraph companies precluded the realization of this. Brazil is practically tied up to an English cable company until 1933, Mr. Carson says in the *Fourth Estate.*

The government-owned and operated lines in the South American countries are not especially noted for speed and accuracy and are poorly adapted to the transmission of press matter. The Central and South American Telegraph Company is the only company that operates a really efficient line. At present it carries more than seventy-five per cent. of the press matter that reaches South America and its lines are kept in first class order.

There is no field for an American daily in all South America, said Mr. Carson, and will not be for some time to come.

Daylight Saving.

Scientists and educators are not agreed on the advantages of the daylight saving scheme tried in Europe last summer. The report of a committee of the American Astronomical Society on the subject shows that two of the five members favored the plan; two opposed it, and the fifth member favored putting it into experimental operation. The report of the dissentients states that not one scientific society has supported the plan.

Daylight Saving Convention.—The National Daylight Saving Convention will hold a meeting at the Hotel Astor, New York, January 30 and 31. Mr. Marcus M. Marks, Borough president of Manhattan, is chairman of the committee. The plan is to have every clock in the United States turned forward one hour on May 1 and back again on September 30.

Time Advanced in Australia.—From January 1 until the last Sunday in March mean time will be advanced one hour in all states of the Australian Federation including Tasmania.

OBITUARY.

E. J. Mock, president of the Electricity Magazine Corporation, Chicago, publisher of the *Telephone Engineer* and *Electric Vehicles,* died on December 18, 1916.

E. von Eye, aged seventy-seven years, connected with the Southern Pacific Railroad all through his business career, died in Dutch Town, La., recently. He was a resident of New Orleans for many years and was well known to telegraph people.

Nelson A. Buell, aged seventy-two years, former manager of the Cleveland, Ohio, office of the Western Union Telegraph Company, died in that city, December 31. He was well known in telegraph circles, his father having been a manufacturer of telegraph instruments in Cleveland in the early days of the telegraph. Mr. Buell was retired from active service ten years ago.

Robert W. Bender, aged seventy-four years, a well known old time telegrapher and during the Civil War a member of the United States Military Telegraph Corps, died at Washington, D. C., January 9. Mr. Bender was one of the best known telegraph men of Washington, having been identified with the Western Union service in that city for about fifty years. He was an attendant at the reunion of the Old Time and Military Telegraphers in New York last September.

Efficiency Engineering in the Telegraph Service.

BY M. J. DUGGAN, DISPATCHER, WESTERN UNION TELEGRAPH COMPANY, CHICAGO.

May I have your permission to comment on the article in your December 16 issue on Efficiency Engineering, especially that section quoted from the London *Electrical Review?* First, I wish to state that no critical spirit of judgment is intended, but rather is an effort made to direct attention to another view of efficiency, from the writer's standpoint.

The article in question is, of course, intended to give an idea of how efficiency may be attained, and it deals with certain qualities that are deemed by the author as desirable if one is to be efficient. First, the article states that a sense of superiority will give an official confidence. But is this correct? Much depends on what definition one puts on this sense of superiority, for humanly speaking, this condition is nothing more nor less than plain gravitation towards egotism, man's most subtle enemy and the ultimate destroyer of efficiency. A sense of superiority is commonly a feeling that one is, personally, the source of some superior, good and desirable qualities that cannot be attained by anyone else, and for this reason the possessor of such extraordinary and exclusive gifts deserves attention, somewhat akin to homage, from those who are associated with him in the work-a-day world of commerce.

This, it seems to me, is entirely in contradistinction to the true sense of efficiency, wherein one knows that while one may be filling a position satisfactorily and efficiently, his intelligence in so doing is not personal, but can be attained by those about him, and such a one will so co-operate with those about him that the general efficiency will rapidly rise. In this there is no feeling of aloofness nor of egotism, yet there is always a healthy consciousness of one's true worth, as well as the worth of one's subordinates.

The article also states that there is no harm in an official being "slightly puffed up." But is this true? Is not this, in itself, the very essence of egotism? And here I might say that this blight of egotism is not always so much the sense that we ourselves are so superior, as it is so often the sense of the other fellow being so inferior. It takes considerable of man's time to be puffed up; it must draw his attention from other things in order to be conscious of the fact that he is "somewhat puffed up," and this alone, if nothing else, detracts from his efficiency—if such a person could possibly be efficient. Then what a dampening ardor on the part of those under such an official, when they realize that he is "puffed up;" and they will realize this fact a long time before it begins to dawn on the puffed up person's thought. This breeds the very indifference that we seek to avoid.

The article also states the man on top should not look after details, that these should be left to an assistant. I do not think one would get very far on that basis. I do not think that one can be really efficient unless he is thoroughly capable of mastering and handling details, for it is in this one respect, more than in any other that one's worth is first judged, and it is here that the gold in human character is put through the sluice and separated from the dross. A man, to be really efficient, must not only know how to direct and instruct others in what they are to do, and how to do it, but if necessary, he must be able to step in himself and do it for them—thus proving in a practical way his fitness to lead and direct. A theoretical leader alone never gets far. If all detail is left to an assistant and the man at the top is continually seeking after "big things" to accomplish, he will be always just a step behind those big things, because he is entirely overlooking the trail that leads to them. I do not mean, of course, that the man at the top should devote all of his time to detail, but a really live man will find time to do both, and by utilizing every detail will surely provide a solid foundation on which to build the bigger things. You recall the couplet that says in effect, if one waits idly for big things to come to him for accomplishment, he will never do any big things. I believe that applies here.

Stress is laid on the seeming power of magnetic influence, so-called, and is counted as a considerable business asset in the article. As I understand the term, magnetic influence may appear to be possessed (and used) by persons without much concern as to whether their course of action is compatible with good business or not. Such influence may be used for good or evil purposes, and while a pleasing, congenial personality is indeed an asset, I question much whether one is repaid for cultivating this so-called magnetic influence. One who depends on this is likely to have the experience we often have with our polar relays—he will find himself demagnetized.

The article, may I say, advocates the development of eloquence to take the place of this magnetic personality, should that rather dubious quality be lacking, and dwells on the necessity of convincing your hearers that you are right (whether you are or not) and apparently justifies this recommendation by stating that while the person may realize afterwards that you are wrong, will meanwhile agree to do as you desire..

I suppose we can assume that those we come in contact with daily have very near the same standard of intelligence as we have, and this being so, would it not be very dangerous practice to use our "eloquence" to gain an end that may be so obviously wrong that it is bound to recoil on us later? Is there any efficiency in that? The twentieth century business men do not want eloquence, if that is to supplant or take the place of honest convictions, or if it is to take the place of sound business principle. It doesn't take our captains of industry long these days to catalogue at its true value this ever-present eloquence; it is a medicine that ought to be used very sparingly.

The article states, also, that it is not desirable for the man on top to be "too intellectual." One of the Standard dictionary's definitions of intellectual is "possessing intellect, or intelligence," and a synonym for it is given as "one characterized by a high degree of intelligence." I assume, however, that the writer of the article meant that one should not be absent mindedly intellectual, that is, buried in theory so deeply that he is entirely separated from practical things, and thus has no opportunity to become efficient in a practical way. We can agree with that view.

From my point of view the efficient official is the man, who although he realizes his own worth and his own intelligence, yet constantly seeks to impart that faculty to or rather to draw it out from those under him. He does not feel "puffed up." He knows that the moment he, at the top, feels that way, he communicates that same feeling to his assistant, and the latter to his assistant, and so on down to the office boy. Why not? Will any one say that the man on the top can feel puffed up, because he got there, and deny this right to the man on the rung below, with relatively as great an achievement? Surely not.

The really efficient man is not too intellectual; on the contrary he is constantly striving to reflect still more intelligence, so that he can be of more use to his firm, and so that he can deal more justly with every one and bring forth a greater measure of reward for everyone, himself included. In so doing it goes without saying that he is improving the intellect of every one around him.

The really efficient man does not get irritable; it does not matter whether he is constantly bothered by seemingly trivial things or not; his very efficiency makes him meet those things as their master, never to be made their servant. Such a man drives away all irritation from his staff, and increases its efficiency.

The really efficient man need not take any risks. His very efficiency will give him such judgment that his course of action will invariably be right, and will minimize any danger of loss. It goes without saying that such a man will not wrongfully blame a subordinate for anything that may go wrong. The cure given in the article for bad temper, irritation, etc., on the part of the manager is to take a vacation or change his diet. If a manager thinks rightly about his work, about his staff and about his aims and duties, and spares no time for idle irritating thoughts to rest with him, it is difficult to understand how such a one could suffer from irritation of bad temper. Bad temper is necessarily the absence of good temper, both a quality of thinking. Therefore, if one watches one's thoughts in the first place, one's acts are cared for automatically, and the manager that is doing this has efficiency always with him and the same quality is reflected in his staff. Such a man needs no such auxiliaries as magnetic personality, eloquence or human arguments. His strength is in himself. He is efficiency personified.

Answers to Questions.

Q.—(1) Please explain what difference is caused by the coils of the polar relay being connected in series or in multiple in the bridge of the Western Union bridge quadruplex. I understand that the multiple connection of the relay on the quadruplex improves the common side at the expense of the polar side. Is this due to decreasing the inductive kick of the polar relay and decreasing the ampere turns of the polar relay?

(2) With a bridge quadruplex or duplex not "set up" at the board but with the battery switch thrown to the left upon reversing the polechanger the set meter shows a deflection of say 30 but drops back sluggishly to say 25; does this indicate a series connection of the polar relay, if not, what?

(3) Is the purpose of the 20-ohm resistance, which is in series with a ¼ microfarad condenser across the pole changer points, to prolong the discharge of the condenser? A. H. D.

A. (1) The matter of connecting the coils of the polar relay in series or multiple in the bridge wire of the Western Union quadruplex system, is determined largely by considerations as to which of the two sides of the system it is desired to strengthen in any particular case. In the series arrangement, the tendency is to benefit the polar side at the expense of the neutral side; while the multiple arrangement tends to increase the operating efficiency of the neutral relay at the expense of the polar relay. The advantage on the polar side is due to the increased number of ampere-turns developed in the relay with its coils in series; while the neutral relay is made more effective with the multiple arrangement as a result of the diminished amount of impedance offered to the incoming current by the 5-U coil. The windings of this coil become, in fact, more nearly differential to the incoming currents under the multiple-connected arrangement.

(2) The difference in the deflections observed is due entirely to the presence of the 5-U coil. The windings of this coil constitute the arms of the bridge, the upper one (A) being ordinarily connected with the main line, and the lower one (B) with the artificial line. Under the conditions mentioned, however, the main line is cut off, and the upper winding (A) is now connected to ground through the artificial line via the bridge apparatus. At the moment current is first turned on, the impedance offered by the (B) winding is greater than that offered by the (A) winding, so that a greater proportional amount of current is forced through the bridge connection, as manifested by the throw of the galvanometer. As the impedance of the (B) winding gradually diminishes, more and more of the current flows through that particular branch, and less and less down the bridge wire, until, finally, when the impedance of the (B) winding becomes no greater than its actual ohmic resistance, the amount of current passing through the bridge apparatus is reduced to its normal value.

(3) The particular purpose of the 20-ohm resistance, which is connected in series with a ¼ microfarad condenser across the points of the polechanger, is to avoid the puncturing of the condenser dielectric by the "extra currents" developed at the moment the polechanger armature breaks away from either of its battery stops. The condenser provides a path for these extra currents, which are of high intensity and might injure the dielectric but for the modifying influence of the retarding resistance.

EDUCATIONAL.

Measuring Power by Means of an Ammeter and Voltmeter.

The power in any part of a direct-current circuit may be determined by measuring the current with an ammeter, and the difference in pressure, by means of a voltmeter, between the terminals of the portion of the circuit in which it is desired to ascertain the power. The power can then be calculated by multiplying the ammeter reading, in amperes, by the voltmeter reading, in volts, or

$$P = E \times I.$$

Thus, the power taken by a small motor may be determined by connecting an ammeter in series with the circuit to the motor and a voltmeter across the terminals of the motor. The product of the two instrument readings at any instant in volts and amperes, will give the power in watts being supplied to the motor.

The ammeter indicates the current through the motor and voltmeter combined. This results in an error in the calculation of the power taken by the motor on a basis of the voltmeter and ammeter readings and the value of the error will depend upon the relation between the currents in the voltmeter and the motor circuits. When the current taken by the motor, or load, is large in comparison to the current taken by the voltmeter, the current taken by the voltmeter may be neglected, as it produces no appreciable effort upon the indication of the ammeter. For very accurate measurements, however, the current taken by the voltmeter should be subtracted from the value of the current indicated by the ammeter. The voltmeter circuit may be opened and the ammeter indication taken if there is no change in pressure between the voltmeter terminals, which would be the load current alone.

If the voltmeter be connected across the line before the ammeter—that is, the ammeter would be between the voltmeter connections and the motor—the indication of the voltmeter would not be the true value of the pressure between the terminals of the motor or load, as there would be a certain drop in pressure across the ammeter. The drop across the ammeter should be subtracted from the voltmeter indication in order to obtain the true pressure across the load. With a low resistance ammeter, this drop is very small and may be neglected except when very accurate results are desired.

In the case of an alternating current circuit, the product of the current and the pressure will not give the value of the true power unless the current and the pressure are in phase. Corrections cannot be made for the current taken by the voltmeter and for the drop over the ammeter, as in the direct-current circuit, because the current through the voltmeter is not exactly in phase with the load current, nor is the drop in pressure between the terminals of the ammeter in phase with the pressure across the load. With instruments having low inductance, the error due to a difference in phase of the current and the pressure is very small and may be neglected except in very accurate measurements.

QUESTIONS ON MEASUREMENT OF POWER.

How may the power in a direct current circuit be ascertained, and what instruments are needed?

How is the power calculated from the readings of the voltmeter and ammeter?

Does the ammeter indicate the current through the motor alone?

In an alternating current circuit does the product of the current and pressure necessarily indicate the true power?

What is meant by difference in phase between current and voltage?

Galvanometer Shunts.

As in most cases it is not desirable to permit the entire current used in a test to flow through the galvanometer, part of it is shunted or caused to pass around the latter.

A shunt bears a definite ratio to the resistance of the galvanometer, being generally adjustable to $\frac{1}{9}$, $\frac{1}{99}$ or $\frac{1}{999}$ of its resistance, so that $\frac{1}{10}$, $\frac{1}{100}$ or $\frac{1}{1000}$ part of the current only passes into the galvanometer.

The degree in which the shunt increases the range of deflection of a galvanometer is termed its multiplying power.

If one-tenth of the current flowing went through the galvanometer and nine-tenths through the shunt, the current in the circuit would be actually ten times that through the galvanometer.

The current therefore in the galvanometer must be multiplied by the multiplying power of the shunt to show its true value in the circuit.

In order to find the resistance necessary in a shunt to be used with a certain galvanometer, the resistance of the latter is to be divided by the multiplying power desired less one.

As an example, let a shunt be needed for a galvanometer of 2,000 ohms resistance where only one-fifth the total current is to pass through the galvanometer. This would equal a multiplying power of 5; then $\frac{2000}{5-1} = 500$ ohms.

FORMULA. Let G be resistance of galvanometer; n the multiplying power of shunt; S resistance of shunt; then $S = \frac{G}{n-1}$.

To find the multiplying power of a shunt of given resistance add its resistance to that of the galvanometer and divide the answer by the resistance of the shunt.

For example, galvanometer is 10,000 ohms, shunt 1,000 ohms, 10,000 + 1,000 = 11,000, divided by 1,000 = 11, the multiplying power of the shunt.

FORMULA. Let resistance of galvanometer be G and shunt S; then $\frac{G + S}{S}$ = multiplying power.

Shunts should be connected to the galvanometer by wires of ample size; no undue resistance should be introduced by the connecting wires.

It is a good plan always to use the shunt of greatest multiplying power at first and reduce as occasion requires. Otherwise a heavy current in the galvanometer might injure suspension.

QUESTIONS ON GALVANOMETER SHUNTS.

What is a shunt for when used in connection with a galvanometer?

What is the multiplying power of a shunt?

How is the multiplying power of a shunt of given resistance ascertained?

What is the total value of the current in the circuit when one-tenth of it passes through the galvanometer?

How is the necessary resistance in a shunt for a certain galvanometer ascertained?

How should shunts be connected to the galvanometer?

Standard Multiple Switchboards.

Multiple switchboards are built of all sizes. Standard size sections are built for an ultimate of 3,000, 6,400, 10,400 and 18,000 lines. The two smaller sizes are of the six-panel type. The 10,400-line section has eight panels and the 18,000-line section has ten panels.

For all exchanges with an ultimate capacity of less than 3,000 lines, the standard 3,000-line section is most suitable. It is provided with a space for 200 answering jacks and lamps for each of the three operators' positions.

The number of lines that should be handled by an operator depends to a very large extent upon local conditions. If the lines are principally located in a business district, sixty lines keep an operator busy, but when they are mostly from a residence section, the operator is often able to handle as many as 160, or in some cases as high as 200. In cities having but one exchange for all lines, the average number of lines to the position usually ranges between 120 and 160.

It is often convenient to have the rural lines come in on the local board. When this is done the best plan is to bring them to the second position. The first position should not be used as a regular operator's position, as an operator at this position is not able to reach all the multiple jacks. In equipping a rural position, means must be provided for making connections between rural subscribers, as well as between rural and common battery subscribers. To accomplish this two general plans are used. One is to furnish two types of cord circuits; one for the connection between rural subscribers only, and the other for connections between rural and common battery subscribers and vice versa. The second plan is to use only one type of cord circuit, and have it so arranged as to be suitable for making all kinds of connections. This method is most convenient from an operating standpoint, as the operator does not need to select the cord to be used for any particular connection, thereby saving time. Also, the operator does not require as many cord equipments as where two kinds are necessary.

The number of cord equipments for a regular subscriber's position has been practically fixed at fifteen by most engineers.

The line signals consist of twenty-four volt 1/3-candle power incandescent lamps mounted in lamp jacks arranged ten per strip. The insulating material used in the construction of this jack consists of lava and mica, neither of which is affected by heat as is hard rubber.

The supervisory signals consist of a pair of lamps located in the front of each pair of cords. The lamp jacks are of the individual open construction type. They are mounted on the under side of the key shelf over openings into which the lamps project, and are covered by thoroughly protected opalescent lamp caps.

(To be continued)

QUESTIONS ON MULTIPLE SWITCHBOARDS.

What are the capacities of standard multiple switchboards?

How many lines are assigned to one operator?

In a business district how many lines can an operator look after ordinarily, and how many in a residential district?

How many cord equipments are assigned for a regular subscribers' position at the board?

What size incandescent lamps are used for line signals, and how many are mounted on the lamp jacks?

What is the insulating material used in the construction of these lamp jacks?

What are supervisory signals and how are they arranged on the board?

Resistance in Wireless.

Resistance is an important item in a wireless system. The high frequency oscillations travel over the surface of a conductor only and do not penetrate into the body of the conductor, as in the case of low frequency currents. Plenty of conducting surface must therefore be provided in both the condenser and the inductance coil as well as in all connecting wires or ribbons, otherwise, a large amount of power is wasted in heat. Resistance also aids in preventing sharp tuning, so that there is an added reason for making all the parts of the transmitter of large and generous dimensions. A further desideratum is that all of the circuits as well as the several parts, including the antenna itself, should be as uniform as possible. That is the several conductors should be as direct and uniform as possible; all joints electrically strong; the aerial well insulated; the ground good; the spark gap well cooled, and the several contacts well made. Observance of these matters together with reasonable skill in attuning the several circuits is sure to produce very satisfactory results.

Mr. G. O. Bentz, of Philadelphia, Pa., in remitting to cover a renewal of his subscription writes: "You will find enclosed $2.00 for my subcription to TELEGRAPH AND TELEPHONE AGE. It always affords me considerable pleasure in making this remittance, as I feel I am usually benefited in reading your magazine."

MR. JEFF W. HAYES' DEPARTMENT.

Copies of each issue of TELEGRAPH AND TELEPHONE AGE may be purchased at the office of W. T. Plummer, Room 901, Postal Telegraph Building, Chicago. Mr. Plummer will keep a supply of each issue on hand to meet every demand.

The Pleiades Club.

CHAPTER V.

The audience at the meeting of the telegraph people assembled in session at the Pleiades club on the planet Mars to listen to remarks from Peter A. Rowe and others, were quite on the **qui vive** in anticipation of something out of the ordinary and they were, certainly, well rewarded for their patient waiting.

Mr. Al. Baker, who was presiding, introduced the speaker of the day, for "there is no night" on the planet Mars, and Mr. Rowe was well received.

I have been asked to relate my experience out in the West, but I think that I would prefer to say something upon a subject nearer my heart, Mr. Rowe began.

I did go it some while on earth and were I inclined to be remorseful, I would be very unhappy indeed, but up here in the second heaven we have all learned that remorse is as much to be dreaded as is hate, malice, envy, revenge and a hundred more kindred vices.

Every sin is forgiven as we turn from it and now I have nothing to regret for any shortcomings that I may have had while on earth.

To get back to my topic. I notice on the bulletin board that there is a connection between this mile post on our heavenly flight and my former friends on earth and I would like to have your secretary quote my remarks for the benefit of those who are still tempted in the manner I was, while on earth.

I am rejoiced to know that the South has gone dry, and I am so thankful, too, that the West is following in the same line, and were I again a legislator from Cook County, Ill., I would preach from the house-top and from the hill-top, the great good of national prohibition and I would not cease a moment till I made Chicago a "dry" city. I feel that I would have the hearty thanks of the telegraph and railroad companies and also of all the telegraph employes once the bill became a law and all were inured to it.

Our people on Mars are true blue and there is no insincerity to be found in our ranks. We have all been purged of that and we all feel the better for it.

Mr. Rowe continued in his happy vein to relate his experiences while he was manager at Elko, Nev., when that office was a repeating point, his remarks evoking many merry rounds of applause.

He was very much in earnest in his statements on prohibition and his listeners were greatly interested, Mr. Fred Moxon taking the notes down in shorthand for the benefit of his earthly friends.

The band played, "Father, dear father, coom heim with me now," and a bright little star was placed in Mr. Rowe's crown, Mike Burke all the time whistling enquiringly, "Will there be any stars in my crown?"

"While you are on the subject of 'lifting' the craft, I wish some one of our gifted speakers would say a few words upon the "Telegraph and Telephone Life Insurance Association.'

"I notice the sentiment on the subject is general," said Chairman Baker, "and that it is highly approved of by all of our friends assembled. Much good work along these lines is at present being done in the Chicago office, which I am proud to say never takes a back seat from any place when it comes to doing things right. The present Chicago agent for the Telegraph and Telephone Life Insurance Association has many applications to his 'wampum belt,' as Hawkeye Bill would put it, and this same spirit should be more manifest all over the country. Just see what immeasurable good the association does."

"All these remarks are well timed and I agree with the speakers, but let us have a little fun now. Can't Sam Bracken get out his stalwart nine from the Chicago 1883 bunch and play W. H. Cummings of St. Louis a game of base ball.?" Thus spoke Fred Catlin and many left the club room to witness the game, which was played with much spirit, Chicago, of course, winning with a decisive score.

It was pleasant to note the absolute democracy of feeling pervading the denizens of Mars; there was no feeling of seeming superiority displayed by any one person over another; all were equal and on the same level and plane. Former superintendents were pleased to hobnob with their linemen and chiefs and operators linked arms like brothers and all differences and distinctions were wiped out forever.

Is it not too bad that such a feeling is impossible, or seems to be so, on earth at the present time?

Conversation, visiting and "get acquainted" knots of telegraph men and women now ensued and it was good to notice the many familiar faces of those who came loitering along to take part in the happy meeting.

There was Emil Shape, so well known a few years ago in Milwaukee; George Brigham, from Toledo; John W. Moreland, from San Francisco; Commodore Haines, from Los Angeles; John Henderson, from Portland; John and William Grier, from Salt Lake; ex-manager Snider, from Cheyenne; Frank B. Knight, from Omaha; James Swan, from Minneapolis, and many others.

John Henderson who was acquainted while on earth with all of these gentlemen was kept busy in introducing one to the other, his introduction being accompanied by a humorous sally. Mr. Henderson was in a very pleasant spirit and greeted the Grier brothers most affectionately, calling upon Tom Kehoe, Joe Hurley, Mike Burke, Mike Conway and W. B. Hibbard, to come and take a seat close by where they could all talk uninterruptedly.

Oh yes, here is Joe Sears; the last time I saw him he was in Pioche, Nev., and here is George Millar from Austin, and James Farrell, from Carson and Tom Booth, and "Graphy" from Virginia City.

And now that we are all gathered together and have all the time that there is and we have no work to do at the office, we will enjoy ourselves to the utmost by relating our experiences for the benefit of those who are left behind, knowing that all of our remarks will be carefully chronicled in the TELEGRAPH AND TELEPHONE AGE through its special correspondent on the planet Mars, Fred B. Moxon.

Then followed a series of story telling, of experiences, humorous and pathetic, many of which will find a place in these columns later.

The news had been received of the generous Christmas present given to all employes by the Western Union Telegraph Company which fact occasioned many pleasant remarks from its former operators, accompanied also by a doleful remonstrance from the former stockholders of the company, who could not understand the occasion of this uncalled for extravagance.

A committee composed of Frank Jaynes, William B. Hibbard, Colonel J. J. Dickey and E. P. Wright, framed resolutions of appreciation to be transmitted to the president of the Western Union Telegraph Company, indicating the feeling existing among the former, co-laborers now on the planet Mars. toward that company.

The meeting is still in session and more of its proceedings will receive attention in subsequent issues of this journal.

Early Telegraph Days in the West.

Mr. John Fletcher, superintendent of traffic, Canadian Pacific Railway Company's telegraph, at Winnipeg, Man., recently made some interesting remarks regarding the early telegraph days in the West.

"In looking over the list of operators employed in Chicago in 1880," he said, "the names recalled many interesting personalities of boys I met in the 80's when I worked at Ogden, Utah, some I knew personally and others I knew over the wire but all I had any knowledge of either personally or over the wire were men of the finest calibre. To give you an idea of the character found in some of the boys of the old brigade, I remember on one occasion one operator sending an appreciation of patience and perseverence in the shape of a box of cigars to an operator at Ogden because of the work accomplished during a lightning storm prevailing over the Platte Valley which made continuous work impossible and no work at all if the sender had not been gifted with the qualities which the receiver seemed to admire in a fellow worker. Well, those old times have been rolled up in the past but better times are in store for this old world and while we may not always appreciate the fact, the change is gradually taking place for there is really no pleasure in what we are doing in life unless we are striving to do it right."

Only A Bull.

"Down on the Wabash, far away," Josephine Skinner, a maiden lady, of uncertain age, was night telegraph operator at Roanoke.

Miss Skinner had been a school teacher earlier in life, but learning of the great wealth accumulated by telegraph operators and the handsome salaries which they all drew, determined to shy her castor into the telegraph arena.

It is well known that people of mature years never become expert at the key. Some can never make the letter "j", some are indifferent with the letter "p", but Miss Josephine fell down when she essayed to make the letter "m'. It was just impossible for her to make that letter on the key, and she invariably sent it "ll" instead of "m".

She was a timid, nervous little woman, easily frightened and the dispatcher at Jackstown knew this and tried to assist her in every way possible.

One night Roanoke, about ten o'clock, frantically began calling Jackstown and informed Billy Sullivan, the chief dispatcher, that a "bull" had broken into the office and she felt her life was in danger, hysterically asking for immediate assistance.

"You say a bull has got into your office?" asked Sullivan.

"Yes, sir," Miss Skinner replied, "a bull is in the office now, and I am so frightened."

Something must be done at once, for a bull in a telegraph office could be as destructive as a bull in a china shop. Hastily securing a crowbar, two shovels, pick-axes and the like, a handcar was pressed into service and dispatcher Sullivan and section boss Kelly started on their gallant errand. Thirty minutes later the handcar stopped in front of the little shack of a depot.

Rushing in armed to the teeth with their railroad implements, Sullivan asked the night operator what had become of the bull.

"What bull are you talking about?" queried the now placid Josephine. "I did not say anything about a bull. I just told you there was a bum here, and there he is now," pointing to a fat knight of the road, stretched out on the floor, soundly sleeping and snoring to beat the band.

The Postal Interests at Indianapolis.

On my recent visit to Indianapolis I was much impressed with the spirited management of the Postal Telegraph-Cable Company at that point. Everyone connected with the service seemed to have been especially drilled to occupy the position which he so admirably filled. This, however, could not be otherwise when one considers the master mind that controls the forces at this point. Mr. J. F. Looney is the superintendent of the Postal interests and everyone in the service is imbued with his business methods and capabilities. No man can make a mistake in using Mr. Looney as a model. The same energy displayed at Indianapolis is found in every office constituting the third district of the Western Division, which is presided over by that gentleman. The principal offices and the names of the managers in his district are as follows: J. J. Martin, Albion; Miss H. I. Muldown, Anderson; Mrs. M. A. Swan, Auburn; B. A. Noe, Columbus; W. L. O'Keefe, Connersville; H. M. Williams, Crawfordsville; E. C. Brewer, Dyer; A. M. Barnes, Elkhart; G. L. Pierce, Evansville; E. J. Ehrman, Fort Wayne; F. E. Taulman, Franklin; L. J. Vesey, Goshen; C. Y. Henderson, Hazelton; E. J. Huber, Indianapolis; C. Griffiths, Lagrange; F. E. Fisher, Laporte; V. R. Thorne, Lafayette; I. A. Michael, Ligonier; Helen Regula, Mishawaka; H. B. Tull, Monon; A. Sutton, Muncie; Mrs. M. G. Sibley, Newcastle; J. P. Randall, Richmond; Laura McNeff, South Bend; J. H. Eudaly, Seymour; F. O. Hawkins, Terre Haute; Mrs. E. L. Hoard, Vincennes; L. Dolman, Westville; A. W. Schwarz; Kendallville; F. P. Scott, Kokomo, Indiana, and A. Osborne, Sturgis, Mich.

LETTERS FROM OUR AGENTS.

NEW YORK POSTAL.

"In every name a story." This phrase has appeared in these pages often lately. There's "Ed" J. Fullum. He's still putting down five on a line alongside the embryo stars of a new generation. When "Ed" began "pounding brass" over a half century ago, telephones, typewriters, sending machines, and even duplexes or quadruplexes were vague dreams—perhaps unthought of.

"Ed" Fullum's clean-cut Morse speeded the night report from Boston on the Eastern Associated Press circuit over the old iron lines of the American Telegraph Company in 1865. There wasn't any short cut to rapid transmission such as the Phillips Code or the Vibroplex. The work was accomplished, just the same, with an unflinching grip on the little hard rubber knob by his resolute fist, and the superb calibre of the early telegraphic stars whose mastery of the quill and keen mentality made the "copy" which pleased editors.

In 1867 there came a pleasant-faced, good-natured young operator all the way from Michigan to try his luck in the Boston office of the American Telegraph Company. He had a peculiar "Roman letter" style of penmanship, such as none of the boys had seen before, nor could anyone successfully imitate it, and they have not succeeded to this day. The young man was "Tom" Edison.

Later, in New York, whither the course of events led both Fullum and Edison, the scientific dabbling of the latter brought him some prominence as an electrical investigator and inventor. Fullum was one of eight operators designated by the Western Union Telegraph Company to help the future wizard experiment with a new-fangled contraption called a "quadruplex." As we all know, quadruplexes are a decidedly valuable adjunct to the telegraph today.

"Ed" Fullum later went West and saw life beyond the Rockies at a time when civilization there was extremely crude, and could no doubt spin many an interesting yarn were he so inclined. In October, 1888, Mr. Fullum joined the operating staff of the Postal main office in New York, then at 187 Broadway.

The engagement is announced of Walter E. McNerney and Miss Lillian Shirley, both operators in this office.

The condolences of the force are extended to operator Robert F. Stewart on the death, after an illness of several months, of his eleven-year-old daughter, Anna.

Miss Lucy Cooper, formerly check girl in the quad department, has been appointed a junior operator, and assigned to the city division.

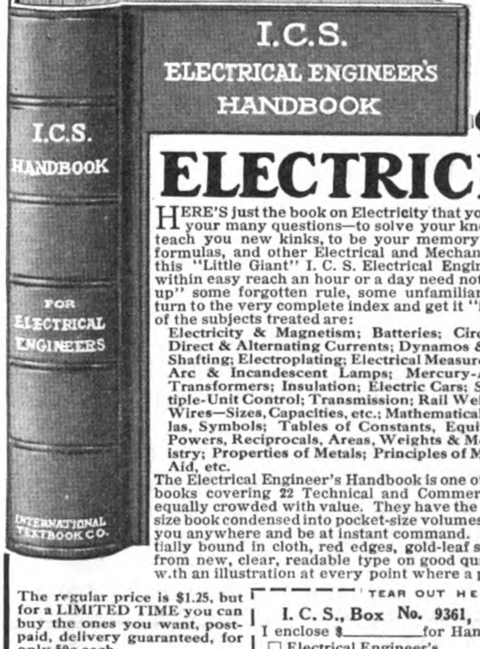
Operator R. H. Graves has been transferred to the branch office at 20 Broad Street.

Operators H. H. Matthews, W. P. Dowd, Miss A. Liebert, Miss P. Doty and Mrs. G. M. Butt were recently added to the force.

Three years ago Miss Jeannette Brown, operator at the Hotel Astor, married a St. Louis millionaire, a patron of the hotel. Her mother, who had been an operator in her early days, took her daughter's place at the hotel, and the company hoped she would be a steady employe. In this it was mistaken, for she, too, was captured by Cupid and married to another hotel guest on January 1.

NEW YORK WESTERN UNION.

G. E. Palmer who was some time ago made the head of the traffic unit in New York City, retains the title of chief operator, having supervision of all employes engaged in traffic work at functional and non-functional offices in the Metropolitan district. The traffic department, represented by Mr. Palmer, will arrange for the necessary circuit facilities and, in consultation with the commercial department officials, determine the method of operation, that is, Morse, telephone, automatic, etc. All changes in the personnel or salaries of employes engaged in traffic work shall have the approval of Mr. Palmer, when they come under his jurisdiction under the plan outlined. Mr. Palmer will also control all matters of force in Western Union offices in the Metropolitan division, such as the assignment of additional traffic employes; filling vacancies due to



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any cause; training of new employes; increasing salaries; dismissals and transfers, etc.

The multiplex installation working between the Central Cable Office, New York and Havana, Cuba, has given excellent satisfaction during the few months it has been in operation.

Business at the Central Cable Office is unusually heavy, necessitating the speeding up of every one identified with the service. Under the guidance of Mr. W. A. McAllister, traffic superintendent, however, everyone is pleased to do his utmost in moving the large volume of business.

M. W. Cummings, one of the veteran operators in the Central Cable Office, who has been absent on account of illness for over a month, is about to be retired by the company. Mr. Cummings has been identified with the telegraph service in New York since the middle seventies.

Division traffic supervisors J. M. Creamer and H. D. Austin are together spending their vacations in Florida.

W. E. Fleming, statistician in the office of J. P. Edwards, division traffic superintendent, Chicago, Ill., and a son of Thomas E. Fleming of this city, was a recent visitor at headquarters.

The Cotton Exchange employes are arranging for their annual banquet which will take place in the near future. These events are eagerly looked forward to by telegraph people generally.

G. E. Palmer, chief operator, recently tendered a banquet and Get-Together meeting to the members of the supervisory staff of the main office and functional branch offices. Besides the heads of the main office supervisory force there were present Joseph Cahill of the Cotton Exchange; W. A. McAllister of the Central Cable Office; W. A. Schudt of the Produce Exchange, and F. A. Karl of the 91 Wall Street Sugar District offices. J. P. Kelly, chief operator of the Commercial News Department, Chicago, was the guest of the evening. Mr. Kelly expressed himself as highly pleased with the Get-Together meetings which were apparently so productive of results of benefit to the service.

H. M. Heffner, the head of the Commercial News Department, New York, is making a three weeks' trip to the larger points in the Eastern Division, including Philadelphia, Baltimore, Washington, Pittsburgh and Buffalo. He will also visit Chicago before his return. Mr. Heffner's trip is for the purpose of standardizing the Commercial News Department work, and for the general improvement of the service.

Joseph Cahill, chief operator of the Cotton Exchange office, was married at Orange, N. J., December 28 to Mary Knudson, of Metuchen, N. J. Mr. Cahill has established his home on New Street, New Brunswick, N. J. When the wedding became known to the members of the Cotton Exchange they united in giving Mr. Cahill a great send-off.

PHILADELPHIA POSTAL.

Business continues good and the following operators have been added to the waiting list: Joseph B. Milgram and Michael J. Kushner. A number of operators were recently transferred from the waiting list to regular assignments.

The office in the Philadelphia *Evening Telegraph* has been closed, and A. C. Carmine, operator in charge, has been transferred to the main office operating force.

Samuel Getis, night printer chief, has returned from a short vacation with friends in New York.

Mary A. Walter has been temporarily transferred to the Pottsville office during the absence of Miss Williams.

M. J. Hasson has been appointed chief clerk in Manager Wilson's office. He is succeeded in district foreman Gorsuch's office by Russell Keys.

Laura Williams, for a number of years in charge of the Pottsville office, has resigned on account of duties at home requiring her attention. She is succeeded by George Lord.

H. L. Eastman of the operating department is the proud father of a newly arrived son on Jan. 9.

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NEW YORK FEBRUARY 1, 1917.

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Fear.

Fear is one of the greatest obstacles to personal development and advancement, and it expresses itself in a variety of ways. A queer thing about it, it is all imaginary. It has been truly said that our worst troubles are those that never happen. When we analyze trouble we find that it is based on fear every time. Fear is a depression upon our lives and activities; it engenders, hate, discontent, malice and every other imaginary evil. A fearless man is one who is progressive and looks at life through a crystal magnifying glass. He sees nothing but good in everything, and his enthusiastic spirit permeates the surrounding atmosphere to such an extent that all within its influence feel its good effects. No one can do his best work when he allows himself to be governed by senseless fear.

Activities of the Association of Railway Telegraph Superintendents.

One of the most active bodies of men banded together for a common purpose is the Association of Railway Telegraph Superintendents. Its membership is composed of bright, energetic individuals, and the work accomplished by it is of incalculable benefit to the railroad business.

The present management of the association has some large plans laid out for this year's work, and special committees have been appointed to investigate and report their findings and recommendations in regard to any development which shall be for the advancement of the efficiency of the telegraph, the telephone and other electrical departments of the railroad service. The committees are made up of wide-awake men and nothing is likely to escape them.

The association is doing important and excellent work for the railroads represented by the members, and the authority and weight of its decisions and activities are becoming a power in the railroad world.

Large Operating Forces.

To say that the telegraph business has greatly expanded in late years and that the operating forces in large telegraph offices have been correspondingly increased does not make much of an impression upon the mind, but when comparative figures of earnings, expenses and net profits are shown then we begin to realize what it means. The enormous expansion of the business is indicated by the number of employes in the principal offices as compared with those of a few years ago.

We have recently seen a few lists of names of employes in various offices and their magnitude was indeed a surprise. In many cases the increase in the number is more than 100 per cent. over what it was less than ten years ago, and the growth continues unabated. One of the first thoughts that come to mind on learning of such large forces is, where do the companies get the money to pay them all? But this question is answered by the fact that while the telegraph business has enormously expanded the income has also correspondingly increased.

It requires system of the highest order to manage big operating forces, such as are found in large cities these days, and one is inclined to wonder how these rapid changes of conditions are met so smoothly without disturbing the established order of things, but when one change is made everything else changes correspondingly and nothing is thrown out of gear.

How to Become a Telegraph Engineer.

We are frequently asked by telegraphers how they can become telegraph engineers. Our reply is there is only one way and that is to study the proper books and acquire the practice as far as possible. It takes time, patience and determination to do this in order to succeed.

There is no easy way to acquire knowledge without brain work. Some people can learn with greater ease than others, but the word "ease" in this case is used in a comparative sense. In selecting books to study care should be taken to get those that will give the best results, and study should be systematic and serious. It requires some sacrifice of time to make a success of any study, and anyone about to take it up should consider the situation well before the start and ask himself "Am I really serious about this undertaking?"

The books having been secured, they should be read and re-read as many times as necessary in order to become thoroughly grounded in the subject, especially the fundamentals. The oftener a book is read and studied the nearer does the knowledge thus acquired by the student coincide with that of the author; in other words, he gets to know as much about the subject as the author himself does. Each time a book is read new light is revealed, and this is a very important thing to practice, particularly in the study of any technical subject, such as electricity.

Government Ownership Craze.

Representative D. J. Lewis of Maryland, the champion of government ownership of telegraph and telephone lines, was given an opportunity to air his ideas on government ownership of the telephone system within the District of Columbia before the House District Committee a few days ago. He thought the "carnival of waste" under the present private ownership could be cured by government ownership.

Mr. Oliver Wilson of Illinois, grand master of the National Grange, favored Representative Lewis' scheme.

"What if it's a failure?" he was asked.

"Oh, I hadn't thought much of that," he replied. "I suppose the government could sell it again. That's the way fellows on the farm do."

Mr. Wilson would do well to study the telephone situation a bit before he makes another break and he and Mr. Lewis are referred to a book recently published in Canada on the subject of the government telephone system in Manitoba. This book was written by a disinterested party, but one fully capable of investigating and discussing the subject from every standpoint. The author is not sparing in his criticism and shows conclusively why the system is a rank failure.

Government ownership means an additional tax on the already overtaxed people, and every means possible should be employed by those who know the facts to crush the absurd doctrine to earth.

A review of the book referred to is published on another page and all government ownership advocates would do well to study it, as it throws a great deal of light on the subject.

Telegraph and Telephone Patents.

ISSUED JANUARY 2.

1,210,389. Manual and Semi-Automatic Telephone System. To William Aitken, London, England.

1,210,424. Telephone Desk Set. To Edward B. Craft, Hackensack, N. J.

1,210,463. Telephone Recorder. To Rupert H. Greenlaw, Lawrence, Mass.

1,210,499. Telephone System. To John H. Levis, Jr., Rochester, N. Y.

1,210,602. Telephone Exchange System. To Henry P. Clausen, Mount Vernon, N. Y.

1,210,603. Calling Device. To Henry P. Clausen, Mount Vernon, N. Y.

1,210,604. Telephone-Exchange System. To Edward E. Clement, Washington, D. C.

1,210,616. Machine-Switching Telephone Exchange System. To Bert G. Dunham, Hawthorne, N. J.

1,210,652 and 1,210,653. Telephone-Exchange System. To Lewis H. Johnson, Bloomfield, N. J.

1,210,884. Phantom-Circuit Loading. To John Franklin Baldwin, Jr., East Orange, N. J.

1,211,031. Telephone System and Apparatus. To Allison Akin, East Orange, N. J.

ISSUED JANUARY 9.

1,211,434. Telephone-Exchange System. To Charles L. Goodrum, New York.

1,211,435. Telephone System. To Edward Alfred Graham, Brockley, London, England.

1,211,534. Telephone Signal Device. To Ura M. Boyd, Dallas, Tex.

1,211,607. Telephone Apparatus. To Maurice K. McGrath, New York.

1,211,612. Switching Device for Telephone Systems. To D. D. Miller, New York.

1,211,688. Telephone System. To Francis W. Dunbar, Chicago, Ill.

1,211,689. Telephone-Exchange System. To Francis W. Dunbar, Chicago, Ill.

1,211,963. Radio Receiving Apparatus. To John A. Proctor, Revere, Mass.

1,212,091. Telephone Attachment. To John Oscar Moisson, Charleston, S. C.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on January 27:

American Tel. and Tel. Co.	126¾
Mackay Companies	88½-89
Mackay Companies, pfd.	66-68
Marconi Wireless Tel. Co. of Am. (Par value 5.00)	2⅞
Western Union	98

PERSONAL.

THE RIGHT HONORABLE ALBERT H. ILLINGWORTH has been appointed Postmaster-General of Great Britain.

MAJOR G. O. SQUIER, well-known to telegraph people through his important inventions in high-speed telegraphy, has been made a brigadier-general and placed at the head of the signal service of the United States Army, succeeding General Scribner, retired.

To Celebrate Mr. Edison's Birthday.

The employes and associates of Mr. Thomas A. Edison will celebrate his seventieth birthday at a dinner to be held in the electric storage battery building, West Orange, N. J., at 6:30 p. m., Saturday, February 10. The event will be informal and entirely social and about 1,500 persons are expected to be present. Some of Mr. Edison's personal friends and former associates are to be invited. Mr. Edison's birthday is really on February 11, but on account of that day falling on Sunday, it was decided to hold the celebration on Saturday the tenth.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. Edward Reynolds, vice-president and general manager of the company, is again at his office after an extended Southern business trip.

General Increase of Salaries.—This company made an increase of six per cent. in the salaries of all employes receiving $1,500 a year and less, in the service since January 1, 1916. This includes all messengers excepting those paid by piece work.

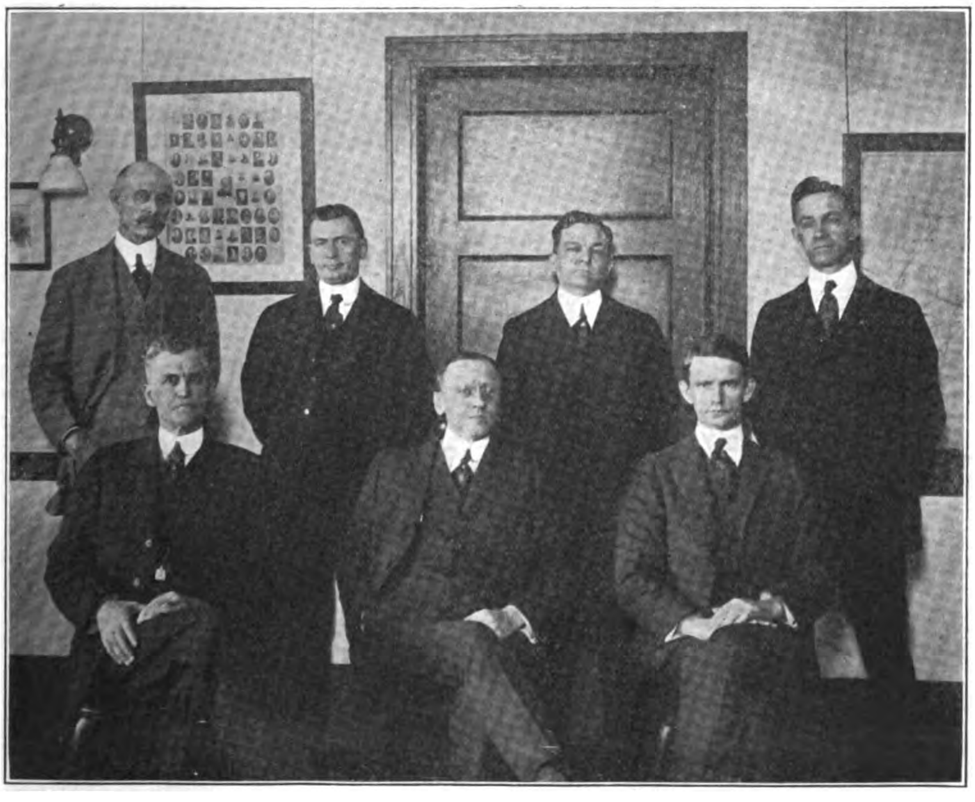
Mr. G. G. Ward, vice-president and general manager of the Commercial Cable Company, has been confined to his bed with a severe attack of influenza since Christmas. His many friends will be glad to know that he is now convalescing and will soon be restored to health.

Changes in District Boundaries.—The lines and offices in the State of Kentucky, formerly in the fourth district, under Mr. W. C. Daviet, have been transferred to other districts; part of them to the third district, Western Division, of which Mr. John F. Looney of Indianapolis, Ind., is superintendent, and a part to the second district of which Mr. Frank W. Sprong of Cleveland, Ohio, is superintendent. The lines and offices in the State of Tennessee that have been part of the fourth district, have been transferred to the third district, Southern Division, of which Mr. William C. Lloyd of Birmingham, Ala., is superintendent. The lines and offices in the State of Louisiana, formerly part of the third district, Southern Division, have been transferred to the district supervised by Mr. Jesse Hargrave, superintendent, whose headquarters are at Dallas, Tex.

Executive Staff, Southern Division, Postal Telegraph-Cable Company.

Mr. G. W. Ribble, recently appointed general superintendent of the Southern Division, Postal Telegraph-Cable Company, with headquarters at Atlanta, Ga., was born in the Valley of Virginia shortly after the close of the Civil War. Because of his father's failing health, his early boyhood was spent in Florida.

Returning to Virginia, he entered the telegraph service as messenger, at Harrisonburg, in 1879. At the age of sixteen he became manager of the Harrisonburg office, which he held for four years, at the same time continuing his studies and prac-



TOP ROW, LEFT TO RIGHT—C. H. ASHBURN, SUPERINTENDENT, RICHMOND, VA.; W. C. DAVIET, SUPERINTENDENT, ATLANTA, GA.; W. C. LLOYD, SUPERINTENDENT, BIRMINGHAM, ALA.; C. G. KNAPP, CHIEF CLERK, ATLANTA, GA.
BOTTOM ROW, LEFT TO RIGHT—B. S. PRICE, SUPERINTENDENT CONSTRUCTION, ATLANTA, GA.; G. W. RIBBLE, GENERAL SUPERINTENDENT, ATLANTA, GA.; J. F. HEARD, DIVISION ELECTRICAL ENGINEER, ATLANTA, GA.

ticing telegraphy and typewriting. From Harrisonburg he went with the Associated Press at Macon, Ga., where he was the only operator, on a circuit of eighteen stations, who used a typewriter. From Macon he went to Washington, D. C., and on February 14, 1888, joined the staff of the Postal Telegraph Company as night chief operator. Mr. Ribble became successively chief operator, manager and superintendent while at Washington, handling many delicate telegraphic situations for the government during the Spanish-American war.

In 1906 his headquarters were moved to Richmond, Va., and in 1910 again moved to Atlanta, Ga. His supervision has covered all of the Atlantic States south of the Potomac, so that he is already familiar with much of the territory embraced in the Southern Division.

Mr. W. C. Daviet, formerly superintendent at Louisville, Ky., succeeds Mr. Ribble as superintendent, with headquarters at Atlanta, Mr. Daviet's former district being apportioned between superintendents W. C. Lloyd at Birmingham, Ala., J. F. Looney at Indianapolis, Ind., and F. W. Sprong at Cleveland, Ohio.

The remaining positions in the Southern Division are unchanged. The organization is as follows: G. W. Ribble, general superintendent; B. S. Price, superintendent construction; J. F. Heard, division electrical engineer; C. G. Knapp, chief clerk to general superintendent, and W. C. Daviet, district superintendent, all at Atlanta; C. H. Ashburn, district superintendent, Richmond, Va.; W. C. Lloyd, district superintendent, Birmingham, Ala., and J. Hargrave, superintendent, Dallas, Tex.

Mr. William C. Daviet, who has been superintendent of the fourth district, Southern Division, with offices at Louisville, Ky., on February 1, assumed the superintendency of the second district, with headquarters at Atlanta, Ga., in place of Mr. G. W. Ribble, who has been appointed general superintendent of the Southern Division.

Mutual Investment Credit Union.—The annual meeting of the Mutual Investment Credit Union of New York City was held at 253 Broadway, January 16, and the following directors and committees were elected: Directors, Edward Reynolds, W. I. Capen, F. J. Kernan, C. Shirley, C. F. Leonard, D. F. Mallen, M. M. Davis. Supervisory Committee, J. F. Skirrow, R. J. Hall, T. E. Hammond. Credit Committee, E. P. Tully, W. B. Dunn, J. J. Cardona, J. A. Manning, J. J. Whalen. On January 19 officers were elected as follows: Edward Reynolds; president; W. I. Capen, vice-president; F. I. Kernan, secretary and treasurer.

Pole Tax in Richmond.—Judge Waddill of the United States District Court at Richmond, Va., has denied the injunction asked by the Postal Telegraph Cable Company to restrain the city from imposing a license charge of $300 annually for doing intrastate business, or a charge of $2 a year for each telegraph pole used by the company in the city.

How to Get Business.—Go after it. To hold it, render an efficient service. Cooperation and loyalty promote efficiency.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

The Morse Electric Club has decided to hold its next dinner and vaudeville at the Hotel McAlpin on Thursday evening, February 15.

Mr. C. H. Simpson, manager of the Springfield, Mass., office of the Western Union Telegraph Company, has been granted a six months' leave of absence. After a short Southern trip he will return to his old home at Niagara Falls, N. Y., where he will spend the remainder of the winter.

Mr. Andrew J. Jenkins, manager of the Western Union Telegraph office at Letohatchie, Ala., and a member of the Old Time Telegraphers and Historical Association, is the chairman of a citizens' committee appointed to secure aid for destitute negroes of Lowndes County, Ala. Their distress was brought about by crop failure and the ravages of the boll weevil.

Mr. C. E. Jones, manager of the Dayton, Ohio, office of this company, addressed the Dayton Rotary Club, January 11, on "The Telegraph as Applied to Modern Business." He compared the conditions as they exist today with those of seventy-three years ago when Professor Morse secured an appropriation of $30,000 from Congress to build a wire between Washington and Baltimore. He gave some interesting facts concerning the company's plant at the present time. It has 210,000 miles of pole lines, 1,581,571 miles of wire, 26,000 offices and employs more than 40,000 people. Mr. Jones repeated the address to the members of the men's class of the First Presbyterian Church on January 19.

Mr. H. B. Simons, former manager at Worcester, Mass., has been appointed manager at Boston.

Mr. J. S. Allen, former commercial manager at Boston, has been appointed manager at Worcester, Mass., vice Mr. H. B. Simons, transferred to Boston as manager.

M. H. Luff has been appointed manager of the Western Union office at Palm Beach, Fla.

Mr. S. H. Strudwick, of the North Sydney, N. S., cable staff, now retired, is in New York visiting old friends and will remain in this vicinity for sometime to come.

John W. Schmults, aged seventy-one years, and for fifteen years secretary to the late president Dr. Norvin Green and afterward connected with the press bureau of this company, later becoming chief clerk to vice-president T. F. Clark, died at his home in Hackensack, N. J., January 18. He retired from active service July 1, 1913, on account of ill health.

The Abstract and Bookkeeping Department connected with the Central Cable Office, formerly located at 24 Walker Street and 195 Broadway for many years, has been removed to 62 Broadway, where it will be consolidated with the service department which is now located at 8 Broad Street. The two departments will be connected by pneumatic tubes which will greatly expedite the service.

Educating Commercial Employes.—A special class has been opened for the education of commercial employes of the Metropolitan Division, New

York, with the idea of promotion. The first session was held on January 23 and the second session on January 26. The class was in charge of Mr. Morris Friedberg, a graduate of Harvard University, and for some time an employe in various branches of the service. It was opened by Mr. James F. Nathan, general superintendent, who addressed the members at length on the purposes of the class. He stated that there was a great opportunity for those who had been chosen, inasmuch as the class was limited to thirty members and that it would be to mutual advantage to the company and the employes alike. Mr. A. C. Kaufman, general commercial agent, and Mr. Joseph Tausek, commercial supervisor, also addressed the members of the class. There will be two regular sessions of the class each week of two-hour periods.

FRIENDLY SUIT TO TEST INTERSTATE COMMERCE RULING.—In order to test the ruling of the Interstate Commerce Commission the Baltimore & Ohio Railroad Company has sued the Western Union Telegraph Company in the Federal District Court to compel it to abide by the terms of an agreement made between the two companies on October 15. 1887, which provided that the railroad should transport free of charge all of the employes of the Western Union Company and everything it needed for construction and maintenance of its lines up to $10,000 a year and charge half rates for services exceeding this amount. The defendant company in return was to frank the plaintiff's messages on an equal ratio. The agreement was to run for fifty years, with the option of an additional fifty years. The agreement was adhered to until April 25 last, when the Interstate Commerce Commission ruled that while railroad corporations might contract with telegraph and cable companies for an exchange of service, those rendered by the railroads must be paid for at the usual rates. Therefore, the telegraph company refused to continue the agreement unless its services to the railroad company in excess of $10,000 a year should also be paid at the usual rates. Since then the telegraph company had been charging the plaintiff full rates for messages.

B. L. Brooks, Division Traffic Superintendent, San Franciso, Cal.

Mr. B. L. Brooks, whose transfer from Denver, Col., to San Francisco, Cal., to be division traffic superintendent of the Pacific Division was announced in our December 16 issue, is a well-known telegraph official of the West. He was born at Houston, Tex., November 30, 1880. His first employment in the telegraph service was at Denver, Col., where he began as clerk, July 1, 1892. He later became a messenger in the Union Depot office at Denver. He was next employed as clerk at El Paso, Tex., being promoted later to the position of operator at that point. In 1902 he was advanced to the managership of the Las Vegas, N. M., office, later resigning to go to San Francisco as operator. He afterward worked in a like capacity for the Western Union in St. Louis and for the Postal in Dallas, as well as for brokers and railroad companies. In 1904 Mr. Brooks was appointed assistant chief operator for the Western Union at El Paso, Tex., and advanced to the position of traffic chief, Denver, Col., in 1906. Within a short time he was appointed night chief operator in the same office, in which position he served until the early part of 1910, when he was made inspector in the ninth district of the Mountain Division when the latter division was created. In September, 1910, he was appointed division traffic superintendent at Denver, and occupied that position at the time of his transfer to San Francisco, with the same title in the Pacific Division.

B. L. BROOKS.

Car Outfit of Telegraph Line Gangs.

A typical outfit for Western Union line gangs is described and illustrated in the *Western Union News*. It consists of four cars, the first being a sleeping car, provided with a double row of upper and lower steel bunks. One end of this car is partitioned off into a small room for the foreman. He is provided with a bed, washstand and a writing desk. A sleeping car is generally a converted passenger or, in some cases, a converted sleeping car, and is from fifty to seventy feet long, depending upon the number of men to be taken care of.

The second car in the outfit consists of a remodeled passenger or baggage car fitted with steel lockers for each man in the gang, writing tables, chairs, etc. This car corresponds to the living room in homes and is used by men when not at work.

The third car is the diner which consists of a passenger or baggage car, the general type being about the same as the sleeping or utility cars. This car is divided into a kitchen containing a range, a water tank, dishes and provisions; a dining room, a store room containing a refrigerator and bins for storing supplies, and a small room containing bunks and lockers for the cook and his assistant; a bathroom containing a shower or bathtub and a general wash room fitted with five or more lavatories and used by members of the gang. The dining car is fitted with three tanks having a combined capacity of about 900 gallons, which supply water for the entire outfit.

The fourth car is a tool car made from a box car and is used generally for storing tools and supplies. It is fitted with a work-bench and bins for various kinds of material. In some cases partitions have been made in one end of the car for a general store room for food and supplies.

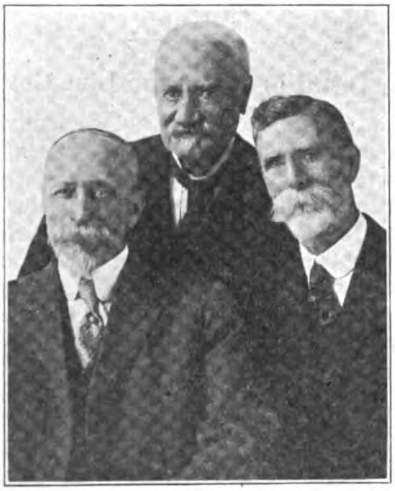
The cars are kept in a sanitary condition and wholesome food well cooked is furnished. The camp cars are generally located convenient to work and the cost of operation is somewhat less than it would be for maintaining the men in boarding houses and hotels.

Fifty-one outfits are distributed throughout the entire plant. The company owns forty of these outfits and operates eleven others owned by railroad companies.

The Original Wheatstone Experts.

The original Wheatstone experts who came from England in 1882 to introduce the Wheatstone system on the lines of the Western Union Telegraph Company, comprised William Finn, Samuel P. Frier and S. H. Strudwick. It so happens that these three gentlemen are at the present time in New York and we have prevailed upon them to furnish us with a photograph of themselves, which we know will be greatly appreciated by everyone who has an acquaintance with them.

Mr. Frier remained in New York, Mr. Finn going to the repeater point at Buffalo, and Mr. Strudwick had to establish the Wheatstone plants in Chicago, Omaha, Denver, Cheyenne, Ogden, San Francisco, St. Louis, North Sydney cable station and at a few other points. The photograph was taken on January 23, and is therefore up to date.


S. P. FRIER, S. H. STRUDWICK, WM. FINN.

The history of the Wheatstone system in connection with the Western Union Telegraph service is sufficient evidence that the duty of these gentlemen was well performed.

All three gentlemen are natives of England and were prominently identified with the government telegraph service in that country at the time they were engaged by Mr. W. C. Humstone while on a visit to England in the interest of the Western Union Telegraph Company in 1882. The three gentlemen mentioned were highly recommended to Mr. Humstone by the late Sir William Henry Preece, then the head of the British telegraph system.

C. H. Carroll, District Commercial Superintendent, Charlotte, N. C.

Mr. C. H. Carroll, whose appointment as district commercial superintendent at Charlotte, N. C., was announced in our January 16 issue, was born at Nashville, Tenn., December 25, 1881, and began his business life as messenger in his native city in 1897.

He worked several years with various railroad companies and entered the service of the Western Union Telegraph Company as operator at Nashville, Tenn., October 1, 1909. On November 1, 1910, he was promoted to the position of local commercial agent at Nashville and to district commercial agent December 1, 1910. On May 1, 1911, he was made district manager of Kentucky with headquarters at Louisville, and was appointed manager at Memphis, Tenn., March 16, 1915. He was appointed acting superintendent at Charlotte, July 1, 1916, and superintendent at the same point January 1, this year.

C. H. CARROLL.

THE CABLE

CABLE SHIPS.—The old cable ship "Dacia," of the India Rubber, Gutta-Percha and Telegraph Company, Ltd., was torpedoed in Funchal Roads, December 3, last. She was in chartered service. The cable ship, "Silvertown," is now being used as an oil tank, not because her usefulness as a cable boat is ended, but because there was no cable laying and she was unremunerative. Her cable tanks exceeded in size those of the "Great Eastern."

Mr. J. P. Spanier, general agent for the Western Union Telegraph Cable System, with headquarters at Naples, Italy, in renewing his subscription for another year writes: "I read your paper with great interest as it keeps me in touch with many of my friends."

Francis B. Gerrard, General Superintendent, the Commercial Cable Company, New York.

Mr. F. B. Gerrard was born at Buckie, Banff, Scotland, July 17, 1854. His wide experience with the practical and technical operations of cables fits him eminently for the post he occupies. His training included the mechanical and electrical construction and repair of submarine cables. Although an expert telegrapher in all the different branches of land-line and cable operation, by nature and training his forte is technical, and he has acquired a mastery of the science and skill necessary to direct the successful operation of the electrical and mechanical equipment.

In 1870 he entered the telegraph service of the British Post Office, and later served in responsible positions with Siemens Bros. & Company (cable manufacturers), the Direct United States Cable Company, and the French Cable Company.

In 1894 he joined the service of the Commercial Cable Company as electrician at Canso, N. S., and later was made superintendent.

In January, 1912, he was appointed general superintendent of the company, vice Mr. S. S. Dickenson, deceased. He is a director of the company and member of the Executive Committee.

Mr. Gerrard is uniformly pleasant and genial with whomsoever he meets or has business relations, and this quality has won for him the regard and esteem of the whole staff.—*Postal Telegraph.*

An All-American Cable from New York "via Colon" to Santos and Rio de Janeiro, Brazil.

Mr. James A. Scrymser, president of the Central and South American Telegraph Company, and of the Mexican Telegraph Company, states that he has won the forty-eight year fight to open direct communication between New York-Santos and Rio de Janeiro, Brazil, via Colon, but that the beginning of the work is held up by the war. British interests, he said, have appealed for the second time from the decision of the Brazilian supreme court but the large favorable vote at the original hearing guarantees a sufficient majority to make the decision stand.

The original decision denied to the Western Telegraph Company, an English corporation, an injunction against the granting to the Central and South American Telegraph Company of a contract permitting the extension of the latter company's cables from Santos and Rio de Janeiro, Brazil, to Buenos Aires. A contract to build cables north from Brazil was impossible, because of the Western Telegraph Company's exclusive right for cables in that direction until 1935. The only way to send messages between the United States and Brazil is across the Atlantic to the Azores or England and back again.

"But with the building of the 'via Colon' route to Valparaiso," said Mr. Scrymser, "and the opening of the line across the Andes to Buenos Aires a way has been open to get to Brazil from this country."

The laying of two cables touching at the most important points in Brazil, Rio de Janeiro and Santos, will provide for 75 per cent. of the traffic, according to Mr. Scrymser.

The cable line from Rio de Janeiro to Buenos Aires will be 1,200 miles long, and will touch Santos in Brazil as well. From Buenos Aires messages will be sent across the Andes to Valparaiso, Chile and thence by cable to Colon and New York.

The Central and South American Telegraph Company opened its lines to Buenos Aires in 1882. At that time the rate was $7.50 a word between New York and the Argentine Republic.

The present rate is 65 cents a word.

In this connection it is interesting to note that the highest point of elevation reached by the company's lines is 12,000 feet, in the Andes, and the lowest is 18,000 feet in the Pacific Ocean, a difference of nearly six miles.

CANADIAN NOTES.

Mr. Charles E. Davies, traffic superintendent, Great North Western Telegraph Company, Toronto, Ont., was a New York business visitor January 26.

Saskatoon Office Damaged by Fire.—The new office of the Great North Western Telegraph Company at Saskatoon, Sask., was partly destroyed by fire January 21. The thermometer registered 27 degrees below zero at the time.

Claim for Damages Discussed.—Justice Dorion of the Superior Court at Ottawa, Ont., dismissed the claim, with costs, of Geo. Tanquay, Ltd., against the Great North Western Telegraph Company for damages for the non-transmission of a telegram.

Advertising Service.—The Grand Trunk Pacific Telegraph Company is advertising day and night messages, day and night letters, Marconigrams and cables by means of neat desk blotters. It is also distributing small celluloid pocket calendars which bear reminders of these classes of service.

THE TELEPHONE.

Mr. Theo. N. Vail, president American Telephone and Telegraph Company, is spending a few weeks at Jekyl Island, Ga.

Mr. E. K. Hall, vice-president of the New England Telephone and Telegraph Company, Boston, Mass., has resigned to become vice-president of the Electric Bond and Share Company, of New York.

The Titles of Mr. A. J. Peckham, commercial superintendent, and Mr. C. G. Sharpe, plant superintendent, Michigan State Telephone Company, Detroit, Mich., have been changed to general commercial superintendent and general plant superintendent, respectively.

Mr. M. B. Downing has been appointed general traffic superintendent of the Michigan State Telephone Company, succeeding Mr. J. W. Bradshaw, resigned.

Mr. Walter S. Gifford, statistician of the American Telephone and Telegraph Company, has been granted leave of absence for twelve weeks in order that he may act during that time as director of the Council of National Defense, which body was recently authorized by Congress.

Mr. W. R. McGovern, engineer of the Chicago Telephone Company has been appointed chief engineer of that company and of the Cleveland Telephone Company, the Michigan State Telephone Company and the Wisconsin Telephone Company, succeeding Mr. J. G. Wray, resigned. Mr. James S. Ford has been appointed engineer of the Chicago Telephone Company to succeed Mr. McGovern.

The Highest Telephone Pole in the world is near Aberdeen, Wash., where the wires of the Pacific Telephone and Telegraph Company cross the Chehalis river. It is 126 feet high and is a single stick of Washington fir. It is set twelve feet in the ground and is guyed with four steel-stranded wires at the top.

Earnings Statement. — The total operating revenues of the Bell Telephone System in the United States for the eleven months ending November 30, 1916, were $240,836,856, and the total operating expenses, $159,198,088, leaving net operating revenues $81,638,768.

Telephone in Honduras.—There is long distance telephone service in Honduras, Tegucigalpa, the capital, being connected with the system. The longest line is 100 miles. The charge for three-minute conversations to any point in the republic reached by telephone is 22 cents, and messages to the boundary departments of Salvador 44 cents. Messages to San Salvador or other remote points in that republic cost 66 cents.

The Texas Company, Mr. James R. Mayer, superintendent, with headquarters at Houston, Tex., recently simplexed all of its circuits and is now using the telephone instead of the telegraph to handle its oil business. The Texas Company is also constructing numerous telephone lines in and around Tampico and Vera Cruz, Mexico.

Name of Telephone Company Changed.

The title of the Missouri and Kansas Telephone Company has been changed to Southwestern Bell Telephone Company, and the property of the Southwestern Telegraph and Telephone Company (New York) in Arkansas, and of the Southwestern Telegraph and Telephone Company (Missouri) in Missouri has been purchased.

Book on Government Telephones.

Government Telephones, the Experience of Manitoba, Canada, is the title of a book just brought out by Moffat, Yard & Company, New York under the authorship of Dr. James Mavor, professor of political economy in the University of Toronto, and will find a hearty reception among students of this important subject. It is a fearless narrative of the true record of an American government in the management of a great commercial business. It tells what happened to the rates and what happened to the finances, what happened to the consumer and what happened to the taxpayer.

After a very exhaustive investigation and study of the subject Dr. Mavor's conclusions are decidedly against government ownership in theory and practice in the conduct of a large telephone enterprise. "The entire history of the government telephone enterprise in Manitoba," he says, "affords evidence of the most positive character against government ownership. * * * The management has been ineconomical, the enterprise has been handicapped by political intrigue, the finances mingled as they have been with the general finances of the Province have been unsoundly administered from the beginning, and the obligations of the public have been enormously increased without adequate compensatory advantages."

It requires no argument to prove that the course and utter failure of the Manitoba experiment would inevitably be the same anywhere else where a large business enterprise is undertaken by the government, and it might have a beneficial effect to distribute several hundred copies of this book among the legislators at Washington.

This book is very illuminating on this important subject and is a plain, straightforward story of a great and costly error made by a misguided government.

The price of the book is $1.00 per copy. Copies may be obtained of Telegraph and Telephone Age, 253 Broadway, New York.

RADIO TELEGRAPHY.

Harry Gibbons, a telegraph operator who was employed by various news services in Rochester, N. Y., a few years ago, is reported to have been drowned recently at Genoa, Italy. He was a Marconi operator on a Mediterranean liner.

MUNICIPAL ELECTRICIANS.

Taunton, Mass.—The city electrician of Taunton, Mass., has recommended that a $20,000 isolation station for the fire alarm telegraph be built. He also urges placing the wires underground.

Competitive Tests for Newark Fire Alarm Head.—Competitive tests will be held by the New Jersey State Civil Service Commission at Newark, N. J., on February 7, to fill the position of fire alarm telegraph superintendent of the City of Newark, to take the place of Adam Bosch, who will retire on March 1. The salary is $3,000 per year. Inquiries for blanks, etc., should be addressed to Civil Service Commissioner at Trenton, N. J. All male residents of the state are eligible.

A Technical Education in Telegraphy.—An easy way to acquire a good technical knowledge of telegraphy is the study of "Correspondence School Lessons in Elementary Telegraphy," by J. H. Penman. This book tells all about electricity in its application to the telegraph and in such an easy way that the study of it becomes a pleasure. The book covers these subjects: The mathematics of telegraphy; potential, current, resistance; gravity battery; derived circuits; arrangement of batteries; magnetism; self-induction; the induction coil; the relay; the sounder; the key; Morse circuit; grounds; switches; line leakage; static induction; testing; testing instruments, etc. This book is for sale by Telegraph and Telephone Age, 253 Broadway, New York. Price $2.00 per copy.

The Christian Religion and the Morse Telegraph.

BY WALTER P. PHILLIPS.

(Continued from page 35, January 16.)

It is surely in evidence just now and I am convinced that many of the pretty typists will have made their exit before another springtime comes to greet the song birds with apple blossoms and lilacs. They remind me of the state in which John Howard Masters found himself, when, puzzled and distraught, he paced up and down the room and indulged in this bit of rhapsody: "Oh woman, woman, ye impale us on a lance as long as life. Had Fate not willed it otherwise, we might detect the incipient shaft that wreathes thy baby lips or see it darting towards us from the eyes of maid or matron fair. As it is we dangle near thee always, pierced through the heart yet all unconscious when and how ye dealt the painless blow that makes man thine forever."

It may be objected that I take too serious a view of the demoralization in the ranks of the telegraph girls that will come when they fall to singing "when a merry maiden marries sorrow goes and pleasure tarries, all the air with love is laden, all is right and nothing's wrong." Mr. Gilbert knew how it was himself. Out of my own book of experience let me take a leaf. Employing many operators, the old United Press had only five women who mastered their profession sufficiently to hold their positions, do the work of the men and collect pay at the masculine rate of compensation. Four of them are married and none came forward to fill the vacancies caused by these women, peaceful and unwarlike as they were, taking to the infantry branch of the military service, as it was carried on in their homes. They raised their children, gave their husbands the moral support and encouragement that is so helpful to the male animal who, according to Elbert Hubbard, never gets beyond wanting to be mothered, and they ceased to take the slightest interest in telegraphy, of any kind whatsoever.

So it seems to me that any telegraphic system which is dependent so exclusively on women, employed at rates below the standard salaries of male telegraph operators is sure to be in a quandary in its attempts to demonstrate an economy of operation as compared with the cost of operating the Morse telegraph with men of experience, judgment, when Hymen swings his torch and beckons the sisterhood to follow a leader.

Judging of the sex as business propositions it is obvious that Hymen is mighty busy in Bridgeport all the year around. The expenditure for rice and confetti must be something staggering in the aggregate. "Come hither, my pretty child, and I will tell you a tale of my wedding day," quoth the old woman in the song. Verily the presence of women as factors in the telegraph situation is of comparatively short duration. As she works successfully and with splendid courage she murmurs to herself that "all the air with love is laden" and she is hopeful that some day "The Gondoliers" will be revived and that she may hear it sung again.

Nearly forty years ago, when I had recently been appointed manager of the Associated Press at Washington, I went to the Riggs House to consult with with Susan B. Anthony, Elizabeth Cady Stanton and others, particularly the beautiful Phoebe Cozzens of the St. Louis bar.

"Do you mean to say, Mr. Phillips," cried Mrs. Stanton in surprise, "that the great Associated Press is going to treat a woman's convention seriously?"

"Hasn't it always done so?" I inquired. I had made my call in the line of my regular duties, not knowing what precedents had been established by my predecessor, Mr. Gobright, of the famous hat, and a familiar figure to Washington and all the world beside.

"Why, Mr. Phillips, you cannot have overlooked the fact that the newspapers sneer at us, and laugh at us. As for the Associated Press, always until now, it has smothered us with silence. If a real report of the proceedings here," Mrs. Stanton continued, "is sent out by the Associated Press, we shall never have our annual convention anywhere else than in Washington."

And I believe her successors continue the practice of meeting in Washington, even unto days like these. In the course of our conversation Miss Anthony made a remark that indicated her great satisfaction to remain in maiden meditation, fancy free. No wedding bells for her, as it were. Mrs. Stanton smiled but said nothing and then she looked at her life-long friend and co-worker in the effort to improve the condition of womankind as one who should say: "My dear, the condition of single blessedness is one of independence and all that, but a hubby is a great convenience and comfort when the heart is sad, and really, Susan, etc., etc."

So, after a long but I trust not unpardonable excursion into the field of the discursive, I come up smiling to say that while woman labor in special fields is not to be compared with man labor, she may be in earnest and perform feats that are almost miracles—as she does in manipulating typewriters and Morkrum keyboards—but it is the man who stays "on and on and on," as Columbus directed his men to sail in spite of their fears and their tendency to become mutineers.

My conclusions are too obvious to require much explanation. I believe the place for the telegraphic destinies to remain is in men's hands, assisted of course, by women whose presence in business carries with it a refining influence that all men recognize and applaud with all their hearts. Any scheme of operation that contemplates lower pay as a means of reaching an economical end is a false and dangerous doctrine—fallacious as applied to employers and unfair to both the men and the women who contribute their respective services in performing the world's work.

Complete success in life cannot be won along the lines which involve an attitude of unfairness toward our fellow men. To shine in the eyes of the world through questionable methods or to reach into society through an adventitious marriage may give the impression that some are "simply perspiring prosperity," as General Taylor of the Boston *Globe* once said of an upstart journalist of equivocal ways of transacting business, but not success in the sense that Thomas A. Edison, Charles M. Schwab, George Peabody, Andrew Carnegie, George Williams, who founded the Y. M. C. A., General Booth and many others have achieved it. Real success is true greatness such as Washington and Lincoln possessed, and there is no abridged route by which it can be reached through a display of that inhumanity to man that, as the poet assures us, "makes countless thousands mourn."

The interesting and important telegraph invented by Donald Murray is altogether too large a subject for my limited canvas but I expect to take that up later. I have made it a rule, always, not to write about matters concerning which I was not fully informed and beyond the facts contained in Mr. Murray's illuminating articles my practical knowledge of his invention as it was originally presented several years ago, and as recently developed in the multiplex is by no means thorough. When I have obtained more light on the subject and can speak intelligently on the significant phase of telegraphy that Mr. Murray has brought forth, I may treat it with such understanding as I possess.

As to Mr. Murray's ingenuity and persistency, there can be but one opinion. They have been admirable from the beginning. I am aware, moreover, that many bright minds have contributed to make the multiplex a wonderful achievement, but I saw the Page typesetting machine which seemed destined to revolutionize the art of printing rise and fall. Its chief inventor was the son of the Page whose patent on the local battery was such a stumbling block for all new comers in the telegraphic field for so many years. To all rivals of the American and Western Union Companies it was an insurmountable obstacle and it confined their operations to the faint mutterings of the relay and forbade their use of sounders. What a boon the main line sounders now furnished by J. H. Bunnell & Co. would have been to weary listeners to the relays of old. And it is a singular thing that it never occurred to the receivers in that remote period to employ the tubes now used in connection with the dictaphone, the telegraphone and other instruments used in connection with dictation and transcription.

Page, the younger, devoted twenty years to making a machine almost uncanny in its apparent intelligence. Great amounts of money were expended, but no real progress was made in the net result obtained. The production, cost of installation and operation showed it could not be employed if considerations of economy were to be regarded. Incidentally the Page machine impaired the fortunes of many Connecticut investors, hitherto deemed to be sane and shrewd, and it was the direct cause of Mark Twain's financial downfall. Even the Mergenthaler linotpye failed and was only a half success in the hands of novices. Several fortunes were spent in its development by Whitelaw Reid, Stilson Hutchins and others who were alarmed by the increasing power of the typographical unions.

The change of policy in the Mergenthaler Company through which the linotype became a brilliant success, and the expert compositors were recognized as absolutely necessary to its unequivocal triumph, was due to the wisdom of Philip T. Dodge, the kind of man that all of us have in mind, when we voice the opinion that brains are the God-given attribute which link man with the Father. Mr. Dodge's concentration of vision and indomitable courage in dealing with some very knotty problems stamped him as one of our great men. He is now the president of the Columbia Graphophone Company, as well as of the Linotype Company, and gradually and with untiring patience he is transforming the moderately successful organization, under the administration of his predecessors, into one of the greatest business institutions in the country. Its product has been vastly improved and its transactions have trebled in an incredibly short space of time. Seemingly its output of grafonolas and records is destined, within a few years, to be ten times as large as when the company passed beneath the magic touch of Mr. Dodge, two years ago. This situation proves, once again, that the world's victories are won, as D'Israeli maintained, by those who have the most information.

Although Mr. Reid changed the *Tribune* office from a non-union shop, which it had been for years, to a pronounced union office, when he was nominated for vice-president in 1892, his action came too late to save the ticket from defeat and President Harrison had to give way to a second term for Grover Cleveland. Had Levi P. Morton or my near namesake, William Walter Phelps, been chosen at Minneapolis, General Harrison would have been re-elected beyond the shadow of a doubt. Fighting expert labor, whether organized or unorganized, is full of dangers as many men who have tried to substitute machinery and unskilled labor for it have learned to their cost and their undoing. Mr. Reid, who was born in America, came of Scotch parentage and was as ambitious a little Scot as Mr. Carnegie, was, as a boy, though his efforts did not lie in the direction of gathering great wealth for a specific and noble purpose as Mr. Carnegie's did. From being the editor of a small newspaper in Xenia, Ohio, Mr. Reid rose by sheer hard work and the exercise of his very unusual and peculiar ability to be one of the great correspondents in the field, during the civil war—"Agate" of the Cincinnati *Gazette*—a Washington correspondent and editorial writer on the New York *Tribune* and at last the successor as its editor of Horace Greeley, abolitionist, philosopher and reformer. Mr. Reid for years was the controlling power in the conduct of the journal founded by Mr. Greeley, and he kept it true to its traditions, as long as he lived, through all the changing newspaper conditions in New York that have occurred since Mr. Greeley's death in 1873.

Mr. Reid's goal, of course, was the presidency. He had many qualities that fitted him for that exalted office, but the compositors would not forgive what they regarded as his repeated and continuing snubs. He served as minister to France with great distinction and it fell to him to present Edison with the full fledged symbol of the Legion of Honor. "What shall I do with it?" asked Edison, and Mr.

Reid replied with a smile, "Perhaps you had better wear it," and he assisted his democratic and gifted countryman to adorn his person becomingly. Later Mr. Reid was appointed minister to England, died there and his body was brought home on a British war vessel. But with it all the fact that his great ambition was thwarted by the hostility of the printers with all that that implies, stands out with great clearness.

(To be continued)

Shop Talk.

BY THE OBSERVER.

(Continued from page 40, January 16.)

Now that we have arrived on time we should be doubly glad—glad because we are able to work, and glad because there is work to be done.

We have often heard the expression: "I love the Western Union twice a month," which of course refers to pay days. Now any time that you feel as if you do not like your work, try to get a pay day smile on you and you will forget your dislikes and the work will seem pleasant. No man can do honest work when he is dissatisfied. Unless you are satisfied and do honest work you lay yourself liable to dismissal by any employer. Would you be satisfied to pay anyone for certain work if they failed to do it? Quite true, there are many days that we feel more like working than we do on others. That is only natural, and for proof we hear such an expression from nationalities of rational beings and we observe their actions. We can see a demonstration of this same feeling in animal life by observing horses and dogs, the two animals most cherished by mankind.

Therefore, if you do not feel disposed to work, are not ill, but you do work and sort of "grin and bear it," you have won the victory and no one will find fault.

It is well known that on dry weather days the way wires work much better than on rainy and foggy days.

It is supposed that your circuit is a good working "way wire" and all the operators are good ones. You never complain, or grumble. This goes along for some time and your presence is like a ray of sunshine. Finally the rainy day sets in. You and the others have a hard time adjusting, reading, etc. Now is the time for stamina. Do not jump up and tell your traffic chief, "This wire is rotten; it won't work," etc. The traffic chief knows that all of his circuits in the "ways" are somewhat weather-laden and he is often sorely tried and needs your help now, so do not fail him. If the distant office is out of adjustment and you cannot break him, and if no intermediate office happens to try, just wait until the distant office closes his key, then try to raise the office in the middle of the circuit and have him call the distant office and tell him to adjust. Many of the "boys" out on the line will do that, without being coaxed. There is always a way where there's a will, hence, do not lose your temper, but remain calm.

Never sit down on a rainy or foggy day and start calling without first pulling the magnets back so that they will not approach the armature as closely as they do during dry weather. Also, give the retractile spring a little more tension, but never stretch it too much as it causes it to lose its elasticity and impairs its usefulness.

(To be continued)

Requisites of a First Class Operator, Founded on Electrical and Practical Lines.

BY J. F. SWAINE, DALLAS, TEXAS.

He must possess sound judgment, bridged by common sense and keyed up to accuracy, by concentration core to core, and in-fuse-d by magnetism. It "relay" takes a "bugger" to fill such a position, with the following calibre—a good rapid transmitter and receiver, capable of quick operation of a typewriter by the touch system, or its equivalent, as it offers two great advantages, viz: first watching copy, and second, counting check.

He must not be a repeater of business, passing over the wire, either at length, or in condenser form, as leaks of this nature, produce trouble and consequent static kicks. He should read and alternate current news, so as to be en-light-ened on topics of the day, and be a generator of power, and brush with the best of associates.

He should be instilled with patience and perseverance, and not allow his crossarm to be guilty of saying unpleasant things, or giving vent to personal feelings, thereby contributing to antagonism.

He should send slowly and firmly to plugs, and not switch to unnecessary conversation.

He should show no resistance to established rules, and special instructions.

He should watch his rq's, bq's, pq's, and he will than have no xq's to offer in the balancing record.

He should display every sign of a gentleman, behind the bat-tery, and in long and short, cut out bk's and jk's.

It is highly desirable, that in order to escape the hardships of drudgery, one should learn a business from the ground up, and in so doing, be in a position to swing to the front.

Any one possessing these qualifications is "ok" for employment, as such men are sought from pole to pole, from a positive or negative standpoint, and are usually a signal success.

Improvement in Copying Telegraphs.

Mr. A. Rappenecker of Bremen, Germany, has been granted a United States patent on a signaling device for writing or copying telegraphs.

Telegraphs for the reproduction of handwriting and the like by a photographic process, require, for producing a light point which leaves marks on a sensitive paper by means of two mirrors each secured to an electromagnetic rotary system, a source of light consisting of an electric lamp. At the transmitting station, it is not known when writing, whether the said source of light is working. This invention enables control of the receiving apparatus to be exercised .without the use of separate conductors, in a simple and ingenious manner. It shows whether the light is burning or not.

Why Telegraph Operators Should Study.*

BY R. M. TELSCHOW, ASSISTANT CHIEF OPERATOR, POSTAL TELEGRAPH-CABLE COMPANY, NEW YORK.

You brass pounders, sit up and take notice. Lift the lid of your brain cells and let in the light. What has been accomplished by others, is possible of duplication by yourself. Throw off the yoke of complacency and decide on a definite purpose. Then compel yourself to act accordingly and there is no limit to the heights you may attain. Persistency will lead you to victory. The telegraph service is as good a field for budding genius as it ever was, and there is abundant opportunity for the ultimate display of your name alongside the illustrious ones of Morse, Henry, Stearns, Edison, Field, Siemens and Marconi.

You may greet this statement with incredulity and assert that these men "got in on the ground floor" of a new science. Ah, if you but realized with what infinite labor they and others built up the complex and efficient systems of telegraph of today! We will grant some were pioneers and had to build the roads, but the result of their efforts gave us the improved methods and machinery, which are to the telegraph the short cuts that railroad bridges and tunnels are to the railroad.

The knowledge afforded as a result of thousands of individual experiments is yours for a few minutes' earnest study. That which required the concentrated efforts of hundreds of clever men for many years you may acquire in one, two or three years by persistent application. By grounding yourself thoroughly in the principles of your business you can become master thereof, and once arrived at that stage you stand upon the threshold of success. Human experience from time immemorial has been that "Heaven helps those who help themselves."

"The spirit of self-help is the root of all genuine growth in the individual," wrote Samuel Smiles many years ago. The leading spirits in all ages whose intellectual greatness contributed to the advancement of civilization began their lives in an humble fashion. The magic which changes the plodding shoemaker, day-laborer, bricklayer, carpenter, weaver, tailor, miner or telegraph operator into the celebrated writer, geologist, architect, physiologist, mathemetician, electrician or scientist is but the marvelous alchemy of self-help. Self-help and personal efficiency are synonymous.

Examples of men and women who have risen from obscurity and commonplace stations in life to the highest positions of usefulness and influence in society, through timely realization of the value of self-help by conscientious study, are so numerous that to attempt a general review would prove a futile task. We could, without half trying, fill a book with the biographies of young men who began their careers in minor capacities, and subsequently rose to high places in the company's service.

Adaptation.

There are hundreds of big men in business today who are not men of exceptional natural ability. Most of the men holding the good positions are men of ordinary ability. They have reached their present positions not by what we usually consider exceptional ability, but by exceptional adaptability. Most of them started in a small way, possibly having had to adapt themselves in the first place to their pocketbooks and get into the first thing that came along, without even the opportunity, which is offered the few, of looking around and selecting their work. They became recognized by their ability to adapt themselves to the work which they had to do. Their individual natural tendencies to work were exercised and developed to meet the requirements of their particular vocation. They applied themselves to the learning of their business by knowing all about each duty that they were given and, at least, a little about the work of the man ahead. Staying with the position and learning all about it thoroughly, to such an extent that one is an authority in his line, is real ability. Nor does it take a wizard to do it. Knowledge of one's work is the substitute for natural brilliancy.

Adaptability means shaping yourself to your work, meeting with at least seeming equanimity the many disagreeable exigencies of the position; playing the game according to the rules your "boss" imposes; conforming to the policies of your superior, whether or not they are agreeable or in accordance with your own peculiar notions of how the business should be run; remembering that if you do conform to them, your turn will come some day and you will be given a chance to try out all your pet schemes and ideas.

During the process of absorption, a little "browsing" around on the edges of the territory of the man higher up is not to be decried. This means the broader view of one's work. Let the employe make it his business to understand the policies of his superior to such an extent that he can interpret for himself the occasional irregularity or unusual condition which arises. The man who can be counted upon for initiative and judgment in an emergency is of more value than the merely faithful plodder. —W. L. Holley in *The Pacific Telephone Magazine*.

Life of Radium Luminosity.

The question is sometimes asked, "How long will radium maintain its brightness?" According to recent research, the "half-period" decay of radium is 1,750 years. Based on this assumption, and taking for example one gram of radium to start with, one-half of this will disappear by spontaneous decomposition in 1,750 years, leaving half a gram. During the next period of 1,750 years one-half of this remainder will disappear, leaving one-quarter gram, and so on. It is thus evident that, for all practical purposes, the life of the radium content may be considered unlimited.

Useful Kink.

BY W. R. EASTERDAY, PLAINFIELD, IND.

A small rubber band folded several times and placed around a pencil near the point makes it much easier to hold the pencil when writing. The fingers may rest on or back of the band. The rubber also has a tendency to prevent the pencil from slipping out of the pocket.

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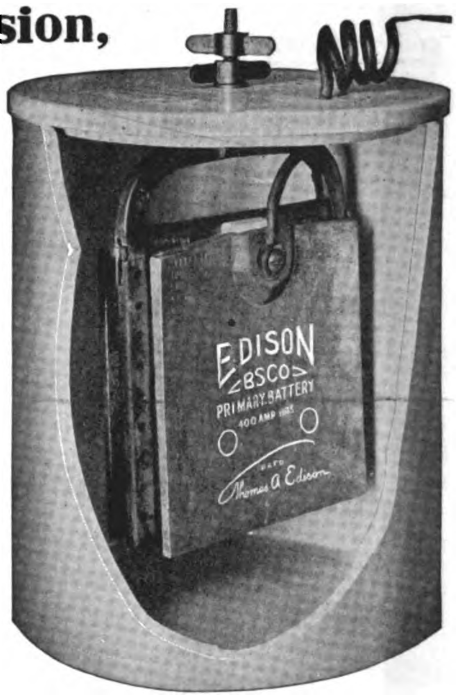
*From *Erie Railroad Magazine.*

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

Improve Your Service by Installing Edison.

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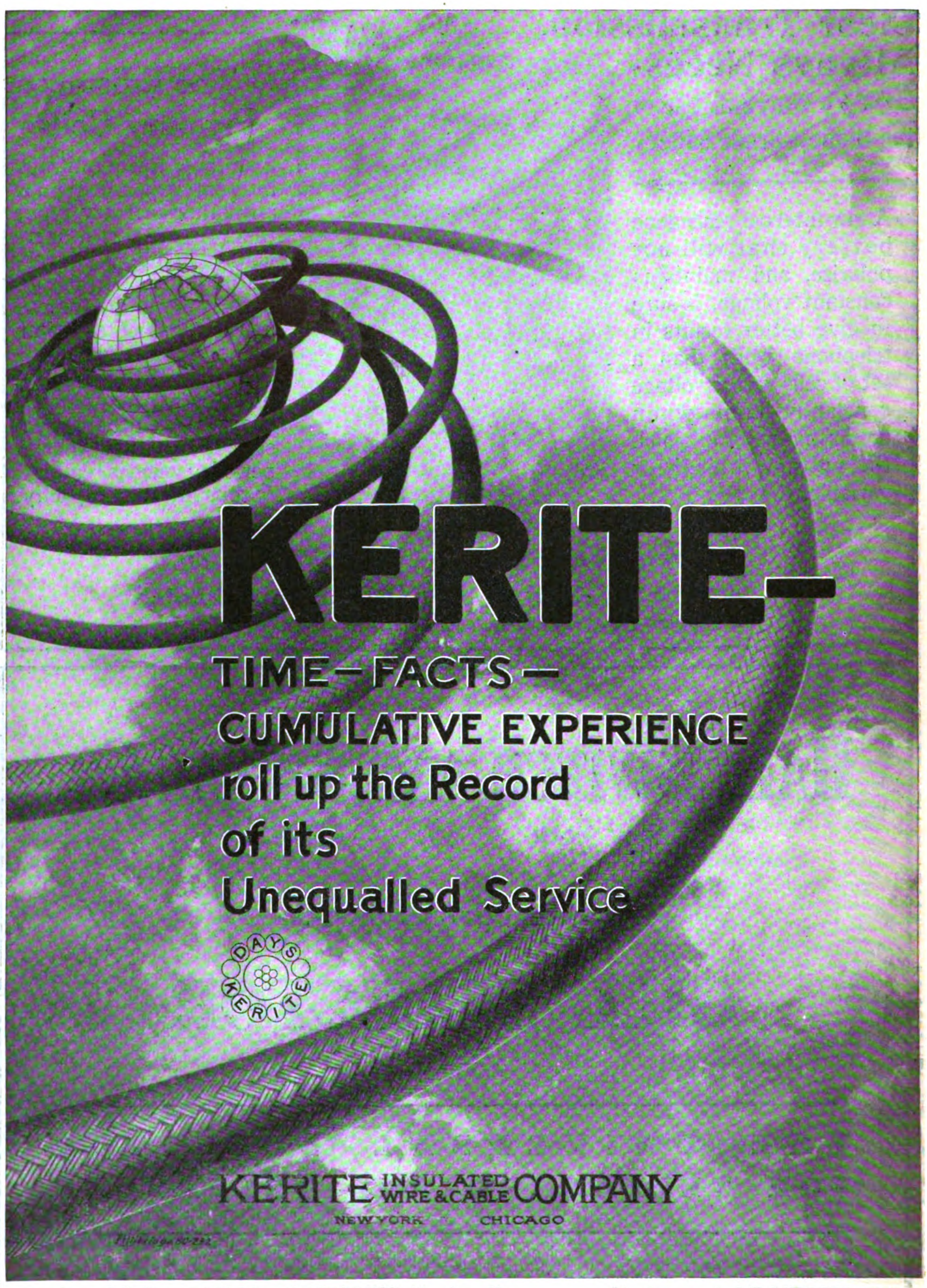
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roll up the Record
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NEW YORK CHICAGO

THE RAILROAD.

Mr. E. R. Fisher, formerly plant superintendent of the Western Union Telegraph Company at Los Angeles, Cal., was appointed last October to the position of telephone and telegraph inspector of the Chicago, Rock Island and Pacific Railroad System, with headquarters at Chicago.

Some Points in Railway Telephone Maintenance

Starting with a magneto telephone the important item is the battery. Within the last few years the dry cell has been improved in quality and reduced in cost, until it has entirely supplanted other cells used previous to that time. The essential features of a dry cell for telephone use are slow deterioration when not in service, the ability to recuperate rapidly during periods of use and long life in service.

An ammeter, for measuring dry cells, should have a resistance about equal to that of the primary circuit of a telephone. Those commonly used have a very low resistance, practically short circuiting the cell under test, which greatly injures it in a few seconds. In measuring the current of a cell a firm contact should be made on the brass terminal, as the carbon offers a high resistance, making a material difference in the reading.

While good results are obtained by connecting batteries in parallel for use with low resistance transmitters, the best results are obtained by using a high resistance transmitter and connecting the batteries in series, three cells being commonly used. The cells should have a moisture-proof covering over the zinc, and should be placed in or as near the telephone as possible, and not less than a No. 19 gauge wire should lead to the transmitter and induction coil. Batteries placed in cellars or other damp places are not only short lived, but as they are connected through the switch hook and secondary to the line, they cause leakage and an unbalanced line. On the other hand, they should be kept away from radiators or registers, as they are worthless when dried out.

The hinges of a telephone should not be used as part of a primary circuit, as the springs deteriorate very rapidly around a railroad, causing opens or high resistance. Where the transmitter is mounted on a door, flexible cords should lead around the hinges. Tinsel telephone cords are very fragile, and their life is greatly lengthened by using telephones and receivers with internal binding posts which prevent their breaking at the tip. They should always be kept dry, as when moist they are noisy and also give a "permanent" signal at common battery exchanges. In renewing cords, care should be used to see that they are not reversed. One way to eliminate this trouble would be to have three styles of cord tips on a triple cord and have terminals that hold only the proper cord tip.

The adjustment of polarized bells is a source of much trouble to some repairmen. No adjustment has been found that will meet all conditions, as a bell at the distant end of a party line necessarily receives less current than a near one, and must have the armature set closer to the core than others. The armature should be so adjusted that the clapper rod will not touch the sides of the hole through which it passes. The gongs should then be moved until they come as close to the clapper as possible without touching it when the armature is resting against the core. This adjustment will allow undamped vibrations of the gongs and the recoil of the clapper will tend to pull the armature away from the coil and strengthen the next stroke. The armature should have as little end shake as possible without binding. The permanent magnets often become demagnetized by abnormal currents and should be replaced or remagnetized by holding them against the field of a motor or an electric generator.

A good hand generator requires very little attention, except a drop or two of oil on the bearings when they become dry. An excess of oil is liable to cause a short circuit by creeping into the armature winding or by softening the hard rubber of the commutator.

Nothing smaller than No. 14 B. and S. twist should be used for subscribers' loops. In splicing twisted pair, a Western Union joint should be made and well soldered. It should be wrapped with rubber tape, then slightly warmed and covered with friction tape. The splices in both sides of a pair should not fall together, as any leakage across joints in wet weather not only causes noise, but soon eats wire off on common battery lines. In dead-ending twisted pairs on insulators, do not make turns short around the wire but let them extend out in a spiral form, covering several inches from the insulator, as wire may be taken down and used again if no short kinks have been made in it. Twisted pairs should not be used for overhead railroad crossings, where open copper will do, as the vibrations from the exhaust of engines cause intermittent opens which are very hard to locate.

Terminal boxes should be waterproof and as nearly air tight as possible, as the sulphur from engines soon destroys the arresters. It is well in case of large terminals to have two sets of doors and pack the bottom of the box with loose asbestos, where cables and wires pass through. A wire screen should cover the bottom of the box outside to keep sparrows from nesting in them, or from carrying away the asbestos packing. Sparrows' nests are often ignited by lightning, thus destroying the terminal. These birds have also been known to strip the wires of all insulation. All lines entering a cable terminal should pass through a pair of fuses and have carbon or copper block cut-outs on the cable end of the fuse. Frequent tests of these should be made to see that they are well grounded.

OBITUARY

H. G. Montgomery, a well-known operator of the Western Union Telegraph Company in Baltimore, Md., died in that city January 3. He was identified with the Western Union service for thirty years.

Mrs. M. K. Quick, wife of Edwin A. Quick, an old time telegrapher who was prominent in the late seventies and early eighties, died in Brooklyn, N. Y., December 31, 1916. She was a soprano singer of note and sang in the choir of several prominent churches in New York and Brooklyn at different times.

PETER KEEGAN, aged sixty-four years, a real estate operator in Brooklyn, and formerly for twenty-five years an operator in the employ of the Western Union Telegraph Company, died in that city January 8.

SIDNEY A. BURNSTEIN, formerly a press operator in Detroit, Mich., died in Northampton, Mass., December 29, 1916.

THOMAS ROCHE, aged seventy years, former superintendent of the Western Union Telegraph Company at Boston, Mass., and an old-time military telegrapher, died suddenly in that city January 21. Deceased was born in Lisbon, N. Y., and learned the Bain system of telegraphy. He took up the Morse system in 1864 while employed on the United States military telegraph lines in South Carolina. After the war he was operator for various telegraph companies, most of the time in Boston. In 1868 he became manager of the Franklin Telegraph Company's office in Boston, and in 1879 New England superintendent of the American Union Telegraph Company. On the consolidation of that company with the Western Union, in 1881, he was made superintendent of the third district. In 1883 the third and fourth districts were consolidated and he remained in charge until 1902, when he retired from the telegraph service.

Morse Mutual Benefit Association of Cincinnati.

The Morse Mutual Benefit Association, composed of telegraphers of both the Postal and Western Union Telegraph companies, as well as some of the railroads in Cincinnati and vicinity, held its twenty-seventh annual election of officers on the evening of January 13. A very enjoyable business meeting was held after which refreshments were served and dancing enjoyed by the members.

The annual report of the secretary shows the association has paid out over $15,000 in sick benefits since its formation in 1895. It is in an excellent financial condition, having over $3,500 in the treasury, nearly all of which is invested in good safe bonds of local origin.

Mr. Frank H. Minning, treasurer of the association for twenty-one years, retired. He has been a very faithful treasurer, and due to his business-like methods has assisted greatly in the upbuilding of the finances of the organization, making it a benefit association of stability. In recognition of Mr. Minning's untiring efforts in behalf of the association, a committee consisting of J. F. Colligan, J. L. Kroner and J. W. Pons was selected to purchase a gift for hi.m

Mr. J. F. Colligan, who was the secretary of the association from its start, retired two years ago after rounding out twenty-five consecutive years of most excellent and ever vigilant service. He is the authority on all matters pertaining to this association and where there is the least shadow of a doubt as to passing on some technical point in paying or rejecting benefits, he is leaned upon for support.

The following officers of the association were elected for the ensuing year: President, W. G. Scholl; vice-president, F. A. Phelan; secretary, H. T. Scoville; treasurer, J. W. Pons. Executive Committee: J. F. Colligan, J. N. Jacobs, W. H. Keer, J. R. Pigman, R. W. Lucas, Jos. J. Snider, Geo. H. Minning. Auditing Committee: H. E. Bryant, W. J. Peters, B. C. Chenal.

At the close of the meeting Mr. Frank H. Minning made a few remarks, wishing the new officers success and health. Mr. Minning is one of the few or about the only one who has never drawn any sick benefits since the start of the association in 1895.

A Valuable Hand Book for Telegraph Engineers.

Telephone and Telegraph Engineers' Hand Book, published by the International Correspondence Schools, Scranton, Pa., is one of the most useful books available for electrical and telegraph engineers and students. It is purely a hand book and does not go into principles or detailed descriptions, but gives tables and rules for quick reference. A few of the most useful tables and descriptions are, conversion tables; specific gravity; electric and magnetic symbols; resistance of wires; powers, roots and reciprocals; rules for electrical measurement, with diagrams; telephony, with illustrations of telephone apparatus and circuits; telegraphy, with various illustrations, including the Athearn repeater used by the American Telephone and Telegraph Company; simultaneous telephony and telegraphy; wireless telegraphy, wireless telephony, etc.

There is so much in the book that it would be impossible to enumerate every subject in the limited space at our command, but it is a work that no student and practical engineer can afford to be without.

The book measures only 3¾ inches by 5½ inches, and can therefore be easily carried in the pocket It contains 398 pages and many illustrations. The price is only 50 cents per copy, which is remarkably low when the value and variety of the contents are considered. Copies may be obtained of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

Exhibits at Automobile Show.

The Stentor Electric Manufacturing Company, Inc., 126 Fifth Avenue, New York, made an extensive exhibit at the recent New York automobile show of its autophones for use on limousines. With these instruments oral communication from the passenger to the chauffeur may be conducted with the greatest ease. The instruments are of attractive and appropriate design. Mr. J. L. Spence, chief engineer, was in charge.

The Weston Electrical Instrument Company, Newark, N. J., showed a complete line of electrical testing instruments for the garage. A competent staff of sales specialists explained to the interested callers the necessity and serviceability of the various instruments.

The Electric Storage Battery Company, Philadelphia, Pa., had a full line of batteries for automobiles and the exhibit attracted much attention.

Efficiency Engineering in the Telegraph Service.

(Continued from page 42, January 16.)

In the previous issue the space usually devoted to Efficiency Engineering in the Telegraph Service was placed at the disposal of Mr. M. J. Duggan of Chicago who presented to our readers a strong argument against the ideas entertained in England on personal efficiency. The article needs no further explanation or comment. It speaks for itself. Mr. Duggan is evidently possessed of the right ideas that make for efficiency, and it is the hope of our readers that he may be heard from again in these columns. What he had to say was both instructive and entertaining and that is the sort of material that everyone identified with the service is looking for.

The one thought that is uppermost in the minds of perhaps every individual is that he should score a success in life. Success should be the object of every man's ambition. It should stand in front of him and he should endeavor as far as possible to travel toward it in a straight line which would mean perfect judgment. This, of course, is well nigh impossible. In our endeavors to pursue the straight path to success there are thousands of errors in judgment which make us deviate to the right or to the left, thus delaying our progress. It often requires both effort and retracing of steps to again return to the line. To reach without hindrance the goal called "Success" requires that we should perform each day's service faultlessly. Each person knows that even fairly accurate judgment would cause us to zig zag to the right and to the left. These deflections could be attributed to many causes. Among them we would enumerate the following: hasty judgment, hearsay evidence, decision without careful consideration, loss of temper, revenge for a fancied wrong, misunderstandings and hundreds of other shortcomings, most of which lead to failure instead of success. Unless a man speedily returns to the lines he is supposed to follow he will never reach the success he is after. Success depends wholly upon one's own effort. Preparedness is everything. The time will come when one will be called upon to do something out of the routine of daily duty, no matter what position in life. Will this emergency call find you wide awake and on your tip-toes, or will you back down and score failure? There come crises in every man's life which demand clear thinking and prompt and accurate action, which can only be obtained by careful training. In most walks of life it is the "survival of the fittest." One man's gain is another's loss. The question that confronts us all is which do we want to be, the successful man or the failure. Anything considered worth while is worth working for. It must be remembered that if we do not succeed, somebody else will. There is always someone alive to the importance of every emergency that arises. Nature has evidenty made this a provision. Everyone should exercise his mind to keep it in working order and thus enable him to win success.

A successful man ought to know how to put a "whip" into his letters, to successfully close wavering prospects, how to bring a delinquent to time, how to supplement and discourage the shortcomings of others, how to get the best out of new employes, how to be able to explain an awkward situation, how to persuade and convince, how to inject the "you element," how to standardize appearance and methods, how to express ideas so that the full meaning may be conveyed, how to overcome prejudice, how to satisfy complaining customers, how to put salesmanship into arguments, how to size up men at long range, how to win good-will and respect, how to win a doubtful prospect's order, how to turn inquiries into orders, and exercise judgment as to whether letters should be short or long, to say no more than is absolutely necessary at the right time and place, not to compromise one's self or the company he represents, and above all to have a pleasing manner, gain and retain friends.

(To be continued)

Efficiency Engineering in the Telegraph Service.

BY C. F. WRIGHT, CHIEF OPERATOR, POSTAL
TELEGRAPH-CABLE COMPANY,
DES MOINES, IOWA.

In reference to Mr. M. J. Duggan's comment and questions regarding article on Efficiency Engineering as published in the December 16 issue of Telegraph and Telephone Age, I wish to share Mr. Duggan's contentions and hope to profit by his suggestions. He has no doubt only the success of the enterprise at heart and is thereby an authority inasmuch as he has no selfish motive.

Could I take exception to a statement in a former issue discussing efficiency engineering to the effect that the telegraph did not demand more or give more to the individual efficiency or prospective. The telegraph and its future depends a great deal more on individual efficiency than does any other line of business. This point should not be forgotten. The telegraph is kept in constant touch with varied and remote businesses. I believe its field is unlimited; that we should lead others to feel the great importance of its mission. It is the medium, the appropriate, the one and only means of a business house's constant, sure and immediate touch with its customers. Telegrams always receive the prompt attention due them, and always will. It remains for managements to make the customer feel that their service (the telegraph) is constantly at his command, economical only because of its expediency and service that is maintained by sufficient methods, sound reasoning with his and his fellow-workers' problems. There could be no "ego" tendency to challenge in such a management. With such motives at heart and the pursuit of the success of one's employer cannot help but make us feel efficient, look efficient and talk efficiency. Can one talk "efficiency" and not practice his preachings? To the efficient comes the task of suggestion for betterment; finding less burdensome methods; more simple and better methods; looking after the little courtesies that soften the bitterness that is bound to come; a straight cut here, an improvement there. Application of force of true unelaborated argument here and lienency there—or just truthfully live a just and equitable life.

EDUCATIONAL.

Assembling Aerial Conductors for Wireless.

In assembling the aerial conductors and the spreaders, it is advisable to arrange everything on the ground first. The wires may be of copper, tinned copper, aluminum or phosphor bronze. Iron wire is not recommended, although it may be used. The phosphor bronze is the most desirable because it is strong, springy, and may be had in a standard strand of seven No. 22 B. & S. conductors. It is generally sold by the foot. Stranded conductors have a slight advantage over solid conductors.

Although copper has less than one-half the tensile strength of phosphor bronze, it is very easily obtained and quite suited to aerials. It has a good conductivity, is pliable, can be easily soldered, and may be had in strands if desired. Ordinary No. 12 telephone copper wire is suitable for experimental aerials. The wire used should never exceed No. 16 or its equivalent in fineness or No. 8 in coarseness.

Aluminum is not so good a conductor nor is it as strong as copper wire, but is pliable and very cheap when compared foot by foot. The main difficulties with aluminum aerials are that the wires are easily broken by twisting and that a non-conductive coating soon forms which practically insulates the joints unless they have been well soldered.

In using aluminum wires, kinks, bends and excessive strains should be avoided. This also applies to other wires. Aluminum is difficult to solder but special solders are obtainable which makes the operation reasonably sure provided the joint is well cleaned to begin with. All joints in the aerial should be soldered and it is also advisable to tape them with a good quality of electrician's tape and rubber solution. Loose contacts in an aerial cut down the efficiency materially and also make the aerial weak mechanically. The high frequency currents must have as clear and as good a conducting path as possible if the waves are to be radiated without considerable loss.

QUESTIONS ON WIRELESS.

What metal can be used for aerial conductors or antennae?

What is the most desirable metal to use for this purpose, and why?

Is it best to use solid or stranded wires for conductors?

How does copper compare with phosphor bronze for use as aerial conductors?

What are the disadvantages of aluminum for aerials?

What care should be taken when aluminum is used?

How should joints in aerials be made?

What is the effect of loose contacts or imperfect joints in aerials?

The Invention and First Principles of the Telephone.

In the year 1876 Alexander Graham Bell and Elisha Gray, two American scientists, invented independently the electro-magnetic telephone. With these inventions the practical application of electrical transmission of speech over wires was for the first time introduced to the world as an established scientific achievement. The telephone soon became an indispensable auxiliary to the expeditious dispatch of affairs in the great field of commerce, in both the civil and military branches of government, in the complex relations of social life and in all other departments of human activity. Previous to the inventions of Bell and Gray, other experimenters had succeeded in transmitting sounds by means of mechanical telephones, which were crude devices, consisting of wooden rods and strings, or wires, stretched between points separated by short distances. Such types of apparatus were known at as early a period as the seventeenth century, but were of no practical value and served only as a source of amusement and entertainment to those interested in the discovery of new phenomena in the transmission of sounds.

The basic principle of all telephone practice, as well as the foundation of all other applied electrical science, is inherently involved with, and dependent upon, the two laws relating to the transformation of electric into magnetic energy and conversely magnetic into electric energy.

An iron or steel bar wound with a coil of wire, becomes a magnet when placed in circuit with a battery, and the electric current is made to flow through the coil. If an iron armature be placed in proximity to either of the poles of this magnetized bar it will be attracted so long as the current continues to flow through the coil of wire; the attractive power of the magnet varying as the strength of the current varies, and losing its magnetic attraction when the circuit is opened and the current ceases to flow. If, however, the bar be of steel and is magnetized permanently, an attractive force, independent of the current, will be exerted upon the armature; but the current will, according to its direction, modify this attractive force by increasing or diminishing it, as the case may be.

QUESTIONS ON PRINCIPLES OF TELEPHONE.

When did Bell and Gray invent the electro-magnetic telephone?

What are the two laws upon which the electro-magnetic telephone is based?

How may an iron or steel bar be made a magnet?

What is the action of an iron armature placed in close proximity to either pole of a temporarily magnetized bar.

If the bar be a permanent magnet what will be the effect of a current flowing through the wire?

Efficiency in the Telegraph Service.—A well known telegraph official writes in regard to the articles we are printing on Efficiency Engineering in the Telegraph Service: "The more I learn of men and things the more I realize that in the upward climb there is just one ladder available and that is mutual consideration and co-operation, all of which have a direct bearing on efficiency."

Answers to Questions.

Q.—When the magneto bell of a telephone receives and transmits a feeble ring and talks faintly, what is the likely cause? W. T.

A.—This trouble may be caused by poor connections through the hinges of the box; a poor ground wire connection; a resistance cross, if a bridging metallic line, or an escape or poor ground, if a bridging grounded line.

Q.—Is it necessary to take out a license for an experimental wireless receiving station, and what are the provisions of the law regarding experimental transmitting stations? A. E. C.

A.—No license is required to maintain experimental wireless receiving equipment. In sending, a license is required. The experimenter must not use a wave length over 200 meters for transmission nor a greater power than one kilowatt if he is further than five nautical miles away from a government station, or not more than one-half kilowatt if within five nautical miles.

Q.—I note that Dr. Lee De Forest has recently been transmitting music by wireless for several miles. Will you please tell me how the apparatus is arranged to produce this result? P. T. R.

A.—For the transmission of a musical selection the microphone is placed inside the cabinet of a Columbia graphophone, where it will get the full volume of sound, and when the Columbia record is made to play, the musical notes, like the vibrations of the human voice, are taken by wire to a coil where they are transformed into high frequency waves of high voltage. Thus they are sent out, by the oscillating audion, for public enjoyment. At the receiving end, the music or spoken word is heard by means of the regular wireless ear pieces. In point of clearness of transmission it is said that the zylophone and the accordion are among the best instruments for wireless transmission, although the brass band, and the human voice, especially if soprano, oftentimes are equally clear to all the listening amateur stations.

Q.—Can you give me the rules for testing wires for resistance, measurement of current, voltage, insulation, etc., in brief form in this department? J.

A.—This is such a large subject that we cannot undertake to give you the information in a limited space. We would suggest that you purchase a copy of Jones' book of Diagrams and Complete Information for Telegraph Engineers and Students, which covers the ground very completely. This book is sold by TELEGRAPH AND TELEPHONE AGE at $2.00 per copy.

INCREASED TARIFFS IN FRANCE.—The telegraph and telephone tariffs in France have been raised by levying a tax of five cents per telegram up to fifty words, in addition to the normal charge of one cent a word, and increasing the annual payment for a private telephone from $80 to $100.

GRIT.—Always keep a good supply of grit on hand for immediate use, as it will carry one through times of adversity, annoyance, discouragement and disappointment. Grit is firmness of character and courage.

Annual Meeting of Serial Building Loan and Savings Institution.

The Serial Building Loan and Savings Institution held its annual meeting at 195 Broadway, New York, January 16. The following board of management was elected: Thomas W. Carroll, president; T. M. Brennan, vice-president; Edwin F. Howell, secretary. Directors: M. J. O'Leary, W. J. Quinn, T. E. Fleming, G. W. Blanchard, C. A. Kilfoyle, M. J. Kenna, J. F. McGuire, C. G. Ross, Chas. Jacobson, J. F. Nathan, P. J. Casey and E. P. Tully.

The sixty-fourth semi-annual statement, dated December 31, 1916, which was presented at the meeting shows the following results:

ASSETS	
Cash on hand	$ 61,745.49
Mortgages	975,294.76
Share loans	22,464.00
Real estate	40,018.47
Shares of Land Bank	10,000.00
Advances	7,059.83
Furniture	400.00
	$1,116,982.55
LIABILITIES	
Members' installments	$ 190,522.63
Savings	435,391.93
Income certificates	368,774.13
Juvenile savings	2,042.13
Land Bank collateral loans	50,000.00
Due on incomplete loans	8,150.00
Special mortgages	6,750.00
Undivided earnings	55,351.73
	$1,116,982.55

The association was established in 1885 and is incorporated under the banking law of New York. It is a member of the Land Bank of the State of New York, and is under the supervision of the superintendent of banks.

OLD TIMERS PROCEEDINGS.—The proceedings of the thirty-fifth annual reunion of the Old Time Telegraphers and Historical Association, which was held in New York, September 26-28 last, are now being distributed to the members. It is the most artistic and finished report issued by that organization and is certainly entitled to a foremost place in the telegraph man's library. For the portraits of prominent people at present or formerly connected in some way with the telegraph it is well worth possessing, and no doubt will be greatly appreciated for this feature alone. The reading matter of course is highly entertaining and the work of preparing it for its permanent book form was admirably carried out, judging from the finished product. The speeches delivered at the banquet form excellent reading, and will enable one to while away a pleasant hour at any time. The proceedings of the Society of the United States Military Telegraph Corps, of which Mr. David Homer Bates is secretary, is also included in the book. Some valuable historical matter is presented and altogether the contents of the book are of unusual interest. Messrs. F. J. Scherrer, secretary of the Old Timers, and Mr. Bates are to be congratulated on the success of their combined work.

MR. JEFF W. HAYES' DEPARTMENT.

No More Keep-Out Lists.

It is remarkable the change that has taken place among the members of the profession in the past few years. It used to be when a correspondent of TELEGRAPH AND TELEPHONE AGE began to write up an office naming the operators, he would be implored to omit certain names from the list for good and sufficient reasons or distort the names so that certain outside interests could not identify them. Now all this has been changed. One can travel from the Atlantic to the Pacific oceans, visit the various offices, write up the staffs, and every person identified with the service is not only willing but anxious to have his name appear in the published rosters. There is no longer such a thing as a keep-out list. Everyone identified with the telegraph service today appears to be happy and contented. All of this makes the work of the correspondent a pleasure.

Personal Notes.

E. P. Cronin, for many years in the Chicago office, and who has been in the western country from Alaska to the Gulf of California, is again at the key in the Los Angeles office doing his ninety-seven messages an hour with the greatest of ease.

John H. Carroll, the noted Chicago operator who has been spending three months in the East has returned to Los Angeles, where he has resumed his position with the Western Union.

Silvio J. Traverso, once connected with the Hasty Messenger and Delivery Company, of Portland, Ore., is conducting a similar profitable enterprise in Los Angeles, in connection with the Federal Telegraph Company.

Jayo McConniffe, a well known old-timer is with the Postal in New Orleans. This information will gladden the hearts of many of his old friends who thought he had taken his heavenly flight.

Tom Austin, recently with the Western Union at Houston, Tex., is now with the Texas Postal at Dallas, and is doing well.

Miss Marion Burr, of Bangor, Me., is the competent stenographer of manager T. A. Darling, of the Western Union at El Paso, Tex.

Wm. A. Porteous, the genial manager for the Western Union at New Orleans, is always seeking what good he can do the community and at Christmas time crowned himself with glory in the good work performed for the orphan children of his native city.

Norman Ringer, once commercial superintendent at Dallas, Tex., has entered another line of business in Los Angeles, Cal.

Gus. Schulze, manager for the Western Union at Galveston, Tex., is the best telegraph man, who does not know how to telegraph, in the country. He handles the Italian and Mexican customers of his city like a real maestro.

Nelson E. Church, manager of the Postal at New Orleans, is an old-time Western Union manager, and brings to his company all the stunts learned with the old company. Mr. Church's earnest and painstaking methods win success for his company.

The many friends of J. Levin of Atlanta, Ga., will be glad to know that he has recovered his health and spirits and is beginning to exhibit traces of that old dynamic energy he possessed years ago. We spent a very pleasant day with him recently.

E. Burke Spencer, so well and favorably known on the Pacific coast, is spending a few weeks visiting friends in Los Angeles.

Nat. Firman, the Adonis of the profession, after trying many other kinds of employment, is again at the key at the Western Union office in Los Angeles. His brother Billy, the well known star operator and all-round athlete, is engaged in ranching in southern California and is doing well.

The Pleiades Club.

CHAPTER VI.

While the telegraph boys of Chicago were enjoying themselves and making merry, a great noise was heard up the line, and a cloud of dust was discernible, acting as a precursor of the California contingent, who had just learned of the recent election on earth and desired to share their honors with their brothers there.

"You've got to come to California if you want to elect a president," exclaimed Commodore R. R. Haines, so long known to the fraternity during his life at Los Angeles.

"California creates wonders and now it is going into competition with Ohio and is developing presidents," sang out James Gamble, and at the mention of his name, there came a mighty applause from all in the grand stand and bleachers.

"I am glad that California is diversifying its products, for if we are to give to the world only our product of native sons we will be having too much competition from among our oriental neighbors," quoth Frank Jaynes, handsome and blithe as ever.

"Well, we have come to celebrate California's part in the election of 1916 and let us do it up right," interrupted Geo. Senf, "and I believe the Chicago club will excuse us for butting in."

"Welcome, gentlemen," said President A. L. Baker, and we invite you cordially to sit at our merry round table and partake of the intellectual feast which we always have to offer a brother telegrapher.

Among the California contingent came a number who had visited San Francisco, tarried awhile and returned to the effete East. Some flippantly remarked that they "beat" it East.

Among this number were the following gentlemen: Jeff Prentice, John Moreland, Harry Converse, David Crawford, John Yontz, William Skinner, George Millar, James Farrell, William Cohen, W. J. Wallis and many other bright lights in the telegraph sky.

Dr. O. P. S. Plummer, the first telegraph superintendent in Oregon and dear old James H. Guild, were there hobnobbing and both bright and happy.

"I am figuring on getting up a telegrapher's tournament up here on the planet Mars," said Johnnie Henderson.

"Are you figuring upon giving your audience an exhibition of 'slow' sending?" asked Billy

Dumars, but John denied the soft impeachment and declared that he believed the talent up in Mars would put the earthly inhabitants to the blush, and the idea was taken up and talked over until everyone was enthused. The day of the tournament was fixed for Washington's birthday.

"I will show them how I used to send in the spring of '73," said Marsh Greene.

"Yes, and I will give them an illustration of fast work, right off the reel, as I took it from C. F. Stumm for the edification of Professor Morse," exclaimed Louis A. Somers, as he carelessly toyed with a very noticeable medal pinned to his coat lapel, bearing some mystic telegraphic symbols.

It being all settled about the tournament, its date and place, the club resolved itself into its original form and several hours were devoted to getting acquainted with the president-makers and welcoming them to this haven of rest.

"Bug" sending, versus hand sending was taken up and discussed, the old-timer advocating the old style and giving his reasons therefor, but this was all dissipated when a coterie of "bug" men rallied to the support of their favorite weapon, giving some startling illustrations of the efficacy of their machine.

"It puts you on your mettle," cried one, "you never know till you make the sense if it is going to be "pome," "home" or "some." It keeps your brain active and working and does not allow you to get mentally lazy with your work, which, unhappily, is too much the case with all telegraph operators."

"You have your nerve to make such a statement, but I really believe you are more than half right after all," said George Baxter, "for I know myself that it is easier to sleep than to think."

"Yes, and it is more blessed to send than to receive," broke in Al Stoner, who had been an interested listener to the discussion.

"Yes, the 'bug' has come to stay until I have so improved by flash light key which will send and do its own receiving at the rate of 1,000 messages an hour," interposed Nick Burke and his audience smiled a little bit unbelievingly.

"We will have a song from H. C. Maynard," but he asked to be excused as he believed he was getting signals from the earth.

"Oh, nothing but echoes from Verdun, you ought to know that," said Albert J. Desson as he came in arm and arm with Dan C. Schull, both of Cleveland.

Some unthinking people may wrongfully accuse the writer of a seeming levity in dealing with the people who have gone before, but they are certainly in error, for that is furthest from his intentions.

Our once earthly friends dwell in a different thought, with different aspirations and desires, none of which is of the earth, earthy. They retain only their happy state of consciousness, and have no remorse or nuts to crack, on this side of Jordan.

Much favorable comment was heard about the Christmas present given the employes by the prevailing earthly telegraph company and many complimentary remarks were made concerning the present organization and its management.

"The telegraph is in its infancy," remarked Gen. Anson Stager, "and I have been taught many things I never dreamed of in my philosophy, Horatio, and I am willing to admit we were all asleep to the business end of the telegraph in 1876, but it is coming now and the only rival of the telegraph will be Uncle Sam and his fast mail.

"New usages will constantly be made of the telegraph, new innovations instituted, a more modern system of delivery will be found and speed will be added to efficiency and accuracy.

"I remember when we thought gross earnings of seven millions were startling and it is hard to realize that the present figures show nearly ten times that amount. Well, good luck go with it," and Gen. Stager took William Orton's arm for a stroll down to nature's canal, hard by.

The San Francisco boys sang, "It is a long way to California," and it seemed evident that they wanted to talk more about California's share in electing a president than ordinary shop talk.

"Do you think the company will further increase the boys' salaries in California because that state elected the president?" asked Bob Hamilton.

"Well they certainly should, because there is nothing too good for California," replied Ed. Fleming, who was on hand with Thomas Reynolds, taking in the sights.

"Sure thing," said Johnny Lowrey, who strolled in at this time. "You are right, there is nothing too good for a native son."

"Gentlemen," said President Baker, "there is only one thing that we cut out up here on the planet Mars, and that is all mention of politics. Religion, we will discuss at any time, because we know that religion is nothing more than getting acquainted with your Maker."

"Those are my sentiments, Mr. President," said D. W. Knapp, who had just arrived on a late California express and who proceeded to shake hands with the old San Francisco friends.

"I have much to tell you of an interesting character," said President Baker, "but I find that the California boys have taken away most of our audience to go down to the canal to see the sights, so we will call this meeting temporarily adjourned."

New Orleans Western Union.

The Western Union headquarters in the Crescent City have always been fortunate in having at the head of the operating department men of integrity and ability. The equipment is up to date in every particular and the office as a whole reflects creditably upon those in charge.

Mr. J. K. Harper is the efficient chief operator and he is the right man in the right place. A man can be a disciplinarian and popular with his force. Mr. Harper is that calibre of a man.

The staff of the office consists of 176 persons, all of them expert in their particular line of duty. J. O. Meynier is night chief operator; A. Foltz, wire chief; C. A. Birge, chief clerk and S. J. Favalora, late night chief operator.

The El Paso, Tex., Western Union Office.

El Paso, as all know, is a very important point, telegraphically speaking, on account of its being the principal gateway to Northern Mexico, and the prominent part it has taken lately in the disturbed relations between the American and Mexican governments. These unsettled conditions have thrown an immense amount of work upon the telegraphic facilities of El Paso and a large operating force is maintained to handle the growing volume of business. On account of the importance of the traffic only the best help is employed. The El Paso staff would shine anywhere.

The operating and clerical staff consists of twenty-eight Morse operators, twenty-eight multiplex operators, nine clerks, checks, etc., besides the heads of the different departments. The names of the latter are as follows: Chas. Vollertsen, chief operator; I. D. Hough, Jr., assistant chief operator; S. Nichols, night chief operator; V. Galas, late night chief operator; W. H. Skidmore, wire chief; W. D. Gregory, night wire chief; C. G. Hull, way supervisor; B. A. Reeves, night way supervisor.

Testing and regulating: R. E. Delzell, day automatic chief; C. E. Etheridge, late night automatic chief; R. N. Guernsey, automatic attendant; R. A. Weyer, night automatic chief.

Dinner of Leased Wire Operators.—The International Association of Leased Wire Telegraphers held its ninth annual beefsteak dinner at Spilker's restaurant, Cortlandt Street, New York, January 21. After the dinner there was a vaudeville performance. There was a large attendance.

LETTERS FROM OUR AGENTS.

NEW YORK WESTERN UNION.

J. J. Griffin has been placed in charge of the testing and regulating end of the multiplex department, relieving R. F. Drehner, who has been made division inspector.

Ham Fitchett, formerly and for many years chief of the Erie Division in this office, now on pension, received his honorable discharge papers for services rendered during the Civil War from Washington a few days ago. Mr. Fitchett is a member of the United States Army Corps of the Army of the Potomac and also veteran of veterans of Poughkeepsie, N. Y. He was identified with the Western Union Telegraph service for forty-eight years and he considers all this glory enough for any single individual.

E. T. Burrill, chief of force, is on a vacation and John Morison is taking his place.

M. F. O'Neill has returned to duty after a serious attack of pneumonia.

J. F. E. Hopkins has been promoted to be late night wire chief, vice J. T. Ewing, promoted to be all-night chief operator.

Recent deaths in this office include: L. D'Agostino, January 11; "Si" Hornet, January 13; Homer Gray, one of the older operators, January 25; Miss Anna Ford, formerly of the automatic department. Miss Ford had been in ill health for a few years previous to her death. In spite of her illness she always had a very cheerful disposition and was beloved by her co-workers. Mrs. J. H. Montgomery, wife of J. H. Montgomery, formerly of this office and now on pension, January 9, at her residence in Passaic, N. J.

A host of friends throughout the service will be interested in the following notes regarding N. B. Topping, night wire chief, who was retired on pension on January 1: N. B. Topping was born in Bath, N. C., October 27, 1843. He entered the telegraph service as a messenger for the old Magnetic Telegraph Company at Goldsborough, N. C., in 1860. In the winter of 1861 he was ordered to report to General J. B. Magruder, the Confederate commander of the Army of the Peninsula, at Yorktown, Va., who assigned him to an outpost near Bethel Church, with eight troopers. When General McClellan advanced against General Magruder in the spring of 1862 the troops holding the outer lines were withdrawn to the main line of defense before Yorktown and Mr. Topping was assigned to the headquarters of General Magruder and then to the headquarters of General Joseph E. Johnston when the latter assumed the supreme command of all the forces before Yorktown. The evacuation of Yorktown followed within a few weeks and Mr. Topping was ordered to Fort Fisher, where he remained until the fall of 1862. A few months of service with General James Longstreet at Suffolk, Va., terminated his connection with the military forces and he was assigned as manager of the Wilmington, N. C., office for what was then the Southern Telegraph Company, which had absorbed the old Magnetic Company. When General Schofield captured Wilmington in the spring of 1865 Mr. Topping was ordered to Greensboro, N. C., where General Joseph E. Johnston surrendered his army to General Sherman in April. All telegraphers were treated as soldiers by General Sherman and were paroled. Mr. Topping, later in the year, accepted service with the United States Military Telegraph Corps and was active until the military handed over the lines to the civil power in 1866. With the exception of one year Mr. Topping has been continuously in the Western Union service in various capacities, in many places, since. For the last thirty years he has served as operator, traffic chief, wire chief and night wire chief in charge at 195 Broadway and 24 Walker Street. Members of the testing and regulating night force presented Mr. Topping with a handsome traveling bag, containing requisites, on the occasion of his retirement. Mr. Topping also takes with him the kindest wishes of all who enjoy his acquaintance.

PHILADELPHIA WESTERN UNION.

The Western Union Symphony Orchestra gave a dance in White's Dancing Palace, January 19. The dance was well attended and attracted numerous Western Union employes outside of Philadelphia. A complete programme consisting of twenty numbers was rendered by the orchestra and the festivities lasted until long after midnight. Every one attending was highly pleased and much praise is due to the orchestra for conducting the affair in such a satisfactory manner. There were about 250 people present. The Western Union Symphony Orchestra is composed of the following: H. Clarence Pearson, conductor; Elliott Russell, violin; Louis Stefan, violin (solo); John Ruland, violin; John E. Watts, cornet; Frank Rasco, cornet; Norman F. Hinkle, trombone; Wm. Hagen, bass; Frank Greenstein, piano; A. Kramer, drums.

BOSTON POSTAL.

Charles A. McGovern has been appointed manager of the Cambridge, Mass., office, vice Charles W. Ayers, resigned to enter other business.

WASHINGTON, D. C., WESTERN UNION.

Robert W. Bender, assistant wire chief of this office, whose death on January 9 was announced in TELEGRAPH AND TELEPHONE AGE dated January 16, started as an operator with the American Telegraph Company in 1862. He joined the Western Union when the two companies amalgamated a few years later. He was a member of the Old Time Telegraphers' and Historical Association and of the Society of the United States Military Telegraph Corps, and served in the Civil War as a military telegrapher. Mr. Bender was a personal friend of President Lincoln and Thomas A. Edison. He was a guest of Mr. Edison last year at West Orange. The pall-bearers were Oscar McCullen, H. F. Taff, W. B. Harveycutter, George L. Diven, Henry Pfaff and R. G. Callum. Among others who attended the funeral were Frank Adams and Charles Claggett from Baltimore and J. W. Collins from Philadelphia. Beautiful wreaths were sent by the wire chiefs of New York and other places. Besides a daughter, Mr. Bender is survived by three grandchildren and two great-grandchildren. His wife died nine years ago.

PHILADELPHIA POSTAL.

Alfred G. Carpenter, office electrician, has returned from a trip to Trenton, N. J., and Wilmington, Del., after completing some extensive alterations in both offices.

Among the recent visitors were J. J. Minor, city foreman, of Washington, D. C., and Ralph G. Carr, loop chief, New York.

The individual operators' records for the year just ended, which were recently posted, show excellent results accomplished by the Philadelphia operators. Fourteen operators, headed by R. J. Furlong and T. J. Fullam, had perfect records and were involved in no errors during the year. Three of these, L. S. Miller, H. O. Steltz and F. P. Burns, have had no errors for two years. Harry Riskie, of the first Pittsburgh circuit, leads in the bonus class, with but one error in the 126,401 messages that he handled during the year. William G. Kurtz, also of the first Pittsburgh circuit, was second. Harry L. Clarke, of the first New York printer, nights, leads in the printer division, with two errors in the 101,321 messages handled. Miss Olga Falcon, first New York printer, days, was second.

Operator L. McCoy has been transferred to our Reading, Pa., office.

H. Bernstein has been transferred to Branch "F," 253 South Twentieth Street, from the Real Estate Trust Building, and is succeeded by operator R. Rendelman.

Cable repairer J. M. Eder is doing extensive repairs in Baltimore.

A. M. McFarland, of the construction department, who was operated upon for appendicitis recently, is able to resume his duties again.

Operators R. L. Ebaugh and M. Bowden have returned to duty after being absent on account of illness.

Chief operator E. W. Miller is the proud father of a newly-born daughter.

Cashier Smith, of Washington, D. C., was among the recent visitors.

CLEVELAND, OHIO WESTERN UNION.

The office of district plant superintendent Sharp at Cleveland, Ohio, has been moved to the new quarters in the Rose Building on East Ninth Street. The commercial and traffic departments will move about April 1.

CHICAGO WESTERN UNION.

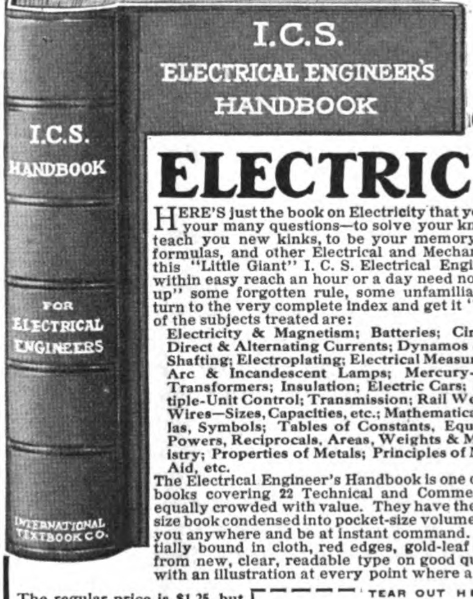
Edward F. Cranley, of the plant department (quad room), died January 6.

Mrs. Grace Catlin died December 18, 1916. Deceased had been in service over twenty-five years as assistant time-keeper.

H. H. Hannon, a well-known old timer of this office, died recently.

INDIANAPOLIS WESTERN UNION.

A majority of the regular day force of messengers was royally entertained at the Y. M. C. A. on December 23 last, by Mayor Rose of Georgiana, Ala., a central figure in Y. M. C. A. circles. A real Christmas feast was spread on three long tables and the boys certainly had their fill. They also thoroughly enjoyed the "work-out" in the gymnasium and a plunge in the large swimming pool.



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They were in high glee the entire evening. The host was given a rising vote of thanks and was presented with a gold knife and watch chain as a token of the esteem of his young friends.

On December 28 ninety messengers and department workers were the guests of Manager P. L. Mounce. A parade was formed and carried out in a very creditable manner and the march finally ended at another long table where a big Christmas dinner was ready to be served. The entertainment was concluded with a theatre party and all voiced their praise and appreciation of the hospitality they had enjoyed.

Appointments: W. L. Adamson, manager, Vincennes, Ind., vice F. W. Booher, transferred to the office of district commercial superintendent J. C. Nelson; F. L. Ault, manager, Warsaw, Ind., vice Miss A. D. Harris, transferred to Attica, Ind.; F. D. Walker, manager, French Lick, Ind.; F. E. Taulman, manager, Bedford, Ind.; A. J. Wiseheart, manager, Pekin, Ill.

Several messengers in the district were recipients of the company's liberal bonuses paid just before Christmas and they share manifestly with all employes in unstinted praise of the generous Western Union spirit which is constantly doing so much for the welfare of its large army of loyal workers.

The one hundred and seventy-five independent offices in the states of Illinois and Indiana comprising the new sixth district of the Western Division make it one of the largest in the country. H. C. Sickels, who has served in the capacity of chief clerk to the superintendents at Indianapolis for many years, will remain at that point. M. J. Grady will go as chief clerk to J. C. Nelson, superintendent, who transferred his headquarters from Indianapolis to Chicago on January 1.

INDIANAPOLIS POSTAL.

We have an efficiency club which meets every two weeks and is proving beneficial to all. In the line of recreation we have organized a bowling club which is doing much good among the boys physically and socially.

ST. LOUIS WESTERN UNION.

Messrs. Newcomb Carlton, president; L. McKisick, assistant to the president; W. N. Fashbaugh, vice-president, traffic department; G. M. Yorke, vice-president, plant department; E. Y. Gallaher, vice-president, accounting department, and officials of the Western Division, including General Manager C. H. Gaunt and Superintendent of Plant M. B. Wyrick, of Chicago, were recent visitors. They inspected the condition and equipment of the different departments here, and as a result it is rumored extensive improvements and additions will be made in the various departments to further facilitate the prompt handling of the growing business at St. Louis.

At the regular meeting of the Western Union Electrical Society, January 18, the following officers were elected for the ensuing year: President, G. R. Alger; vice-presidents, A. C. Cronkhite, W. J. Armstrong, C. W. Mitchell, J. M. Barry, W. J. Dill and Fred. Meinholtz; financial secretary, J. A. Bollato; correspondent secretary, Albert Kern; treasurer, Albert Turner. Executive Committee, Miss Maud Wise, Robert E. Norman and A. F. Templemayer. In charge of Christmas saving fund, the financial secretary and the treasurer. Trustees, F. P. Mullen, Charles W. Jost, A. J. Steinbach, George M. Harrigan and Walter P. Jost. The society will give an informal dance February 13. The entertainment committee announces they will have something interesting for the next regular meeting in February and hope to have better attendance at meetings.

Frank J. Troll, of the operating force, who has been in the employ of the company for forty years, was married to Mary E. Moran, of this city, on January 17.

KANSAS CITY WESTERN UNION.

O. L. Turner, former manager of the Missouri District Telephone Company here, has joined our force, and Lloyd S. Read succeeds him as manager of the Missouri District Company.

DALLAS POSTAL OF TEXAS.

Miss Alma Manly and Otis McDaniel, a member of the clerical force in this office, were quietly married Thursday, December 21, 1916, at the home of the bride's parents near Nugent, Tex. The bride is loved and admired by all who know her. Mr. McDaniel is a young man of fine character. After the ceremony a wedding dinner was served, there being seventy-two present. Mr. McDaniel's marriage leaves but one unmarried man in the general office, and he is now looked upon with suspicion.

The machinery of the Postal of Texas is worknig so smoothly that no changes are being made and every one is doing well and feels that it is to his interest to remain loyal to this company.

32d YEAR

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NEW YORK, FEBRUARY 16, 1917.

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Bravery of Telephone and Telegraph Operators.

What is there about the telegraph and the telephone services that makes their operators so nervy and enables them to keep a cool head under the most trying circumstances? They do not think of themselves at all when confronted with danger, but remain at their posts of duty as long as it is possible to do so, and after everyone else has sought safety in the excitement. It is so often that we read of the heroism of telephone operators that we have almost ceased to wonder at their bravery in the midst of danger and disaster, and the same is true of telegraph operators. Whoever heard of an operator losing his head and deserting his post in the presence of danger? He is always the last to leave, and cases have occurred where operators have given up their lives in the fulfillment of their duty. Wireless operators on ships are noted for their fearlessness, and everyone knows how many of them have sacrificed their lives for the common good.

We refer in this issue to two cases of marked bravery on the part of a telephone operator and a telegraph operator. The former in Kingsland, N. J., surrounded by fire and exposed to imminent danger from exploding shells, remained at her switchboard until she had notified all hands of the great peril surrounding them, and the telegrapher, in the office of a Waterbury, Conn., newspaper, stuck to his post, clad in a rain coat, with water pouring down on him from an adjoining building that was in flames. He stayed and copied dispatches on his typewriter after everyone else had fled to safety.

These are but two instances of the many that are recorded and the courage of these employes compels the admiration of the world.

The Morse and Printing Telegraph System.

The article of Mr. W. P. Phillips on "The Christian Religion and the Morse Telegraph," which appeared in part in the last two issues and is concluded in this issue, has attracted widespread attention. One of its effects has been to revive the old question as to whether the days of the Morse system are numbered and if Morse operators, with all their glory, will soon become memories.

We have pointed out on several occasions in the recent past that there are more Morse operators employed at the present time than ever before and that the rapid rise and development of the printing telegraph, which is the cause of the uneasiness, has, in effect, created a greater demand for Morse men than has been experienced at any time in the past. The telegraph officials themselves agree that Morse will not be displaced for a long time to come, if ever. At the present time there is no intimation or expectation that it will be, but of course no one can tell what a day will bring forth. However, the advocates of the Morse system and the Morse men themselves have no reason to worry.

Printing telegraphy has been in the lime light for two years or more, but that is because it is a new thing, and possesses many novel points to talk about, but it is acknowledged that its usefulness is limited to heavy traffic circuits. These are few compared with the number of lighter traffic and way circuits, which will always outnumber the heavy ones. The printing telegraph is the result of an imperative need for a system to carry a large volume of business over one wire. Pole lines had reached their maximum wire-carrying capacity, so the only way to solve the problem was to make each wire carry more business.

What has really expanded is the telegraph business, and it requires all the facilities afforded by the printers and Morse combined to handle it. Printing machines became necessary for economical reasons. If the telegraph companies had attacked the problem of handling the enormously heavy traffic by erecting wires enough to carry it all they would not have been able to provide seating capacity for all the additional operators in their present quarters, or they would have been compelled to enlarge their offices. The printer came just at a time when it was most needed, and it has developed a field of work of its own, and has not encroached upon the Morse system at all, practically. Mr. Newcomb Carlton, president of the Western Union Telegraph Company, recently stated that if it had not been for the multiplex his company would have been "snowed under."

Printing telegraphy has increased the carrying capacity of circuits 400 per cent., without affecting the speed of handling, and in many ways the general service has been improved. The best evidence of the value of the printing system is to be found in the fact that the Western Union Telegraph Company alone handles fully eighty million messages per year by printers. That is twenty million or more messages than was handled in a single year by the company in any twelve months previous to ten years ago. The Postal Telegraph-Cable Company, and many railroads, are also using printer systems with equally satisfactory results.

Mr. Phillips' contention that the telegraph business would be better handled by straight Morse than by printers is open to weighty questions. He bases his arguments upon the brilliant achievements on the part of Morse men and the failures of machine telegraphy in the past, but many things have happened since that time, and the world has learned a great deal in late years and accomplished many wonderful things—telegraph development being one of them.

Telegraph and Telephone Patents.

ISSUED JANUARY 16.

1,212,202. Submarine, Subterranean and Aerial Telephony. To R. A. Fessenden, Brookline, Mass.

1,212,300. Combined Cut-Out and Lightning Arrester for Telephone Systems. To H. S. Wheaton, Dallas, Iowa.

1,212,492, 1,212,493, 1,212,494 and 1,212,495. Telephone Exchange System. To L. H. Johnson, Bloomfield, N. J.

1,212,705. Telephone-Receiver Casing. To L. Steinberger, Brooklyn, N. Y.

1,212,728. Telephone Exchange System. To W. P. Albert, Chicago, Ill.

1,212,733. Telegraph System. To J. H. Bell, East Orange, N. J.

1,212,785. Telephone Attachment. To J. L. McMillan, Syracuse, N. Y.

1,212,809. Telephone Exchange System. To F. N. Reeves, Newark, N. J., and A. E. Lundell, New York.

1,212,908. Automatic Telephone System. To J. E. Cooley, Manhattan, Kan.

1,213,011. Device for Connecting Outside Wires to Buildings. To P. C. Ragotsky, Philadelphia, Pa. (Telephone).

ISSUED JANUARY 23.

1,213,250. Means for Receiving Intelligence Communicated by Electric Waves. To G. W. Pickard, Amesbury, Mass.

1,213,298. Telephonic Relay. To F. E. Summers, Memphis, Mo.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on February 13:

American Tel. and Tel. Co.	123⅞
Mackay Companies	85-87
Mackay Companies, pfd.	65-67
Marconi Wireless Tel. Co. of Am. (Par value 5.00)	2⅞
Western Union	94

PERSONAL.

Mr. F. W. Cushing, proprietor of the Hotel Moraine, Highland Park, Ill., and a well-known old-time telegrapher, was in New York January 30, visiting friends.

Mr. Patrick B. Delany, the old time telegrapher and inventor, has recently been granted seven patents for talking machines and a patent for detection of submarines. Mr. Delany was recently injured by colliding with an automobile in one of the New York streets. The mishap will confine him to his South Orange home for the next three or four weeks.

Mr. T. A. Edison's seventieth birthday was celebrated in the Edison storage battery building at West Orange, N. J., February 10, by a gathering of 1,800 employes and several personal friends. He received congratulations from all parts of the world, and President Wilson sent a letter of greeting. Sunday, February 11, was the real birthday but on account of its falling on the Sabbath it was held a day earlier. Mr. Edison greatly enjoyed the festivities, Mrs. Edison and his son Charles occupying seats each side of him.

IN GENERAL.

Serial Dinner Postponed.—The dinner which was to have been given to the retiring and new presidents of the Serial Building Loan and Savings Institution, New York, about February 15, has been postponed until some time in April.

The "Espionage" Bill now in the United States Senate provides severe punishment and heavy fines for spies who collect military information and give it to the enemy in time of war. It will be unlawful for any one not entitled to such information to approach or enter telegraph, telephone, wireless or signal stations.

Chicago Aid Society.—The twenty-eighth annual meeting of the Chicago Telegraphers' Aid Society was held January 28. The following officers were elected: President, Chas. A. Dortmund; vice-president, John P. Kelly; secretary, Alfred J. Fuller; treasurer, Richard S. Gill. Executive committee: John J. Harrington, Joseph M. Powers, Florence Reilly, Mamie S. Moffatt, Mae Crowe, John F. Costello, Charles F. Mallon. Auditors: A. L. Ewing, Frank Riley, F. Elfring.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. W. I. Capen, vice-president of this company, New York, left for Cuba on February 10, where he will pass his vacation. He is accompanied by Mrs. Capen.

Mr. G. G. Ward, vice-president and general manager, Commercial Cable Company, New York, is recuperating at Atlantic City, N. J., after his recent illness with influenza. He is accompanied by Mrs. Ward.

Mr. H. C. Shaw, division electrical engineer, Chicago, was in New York on business a few days last week.

Ohio Society Banquet.—The thirty-first annual banquet of the Ohio Society of New York, of which Mr. Chas. P. Bruch, vice-president of the Postal Telegraph-Cable Company, is president, will be held at the Waldorf-Astoria, Tuesday evening, February 27, in honor of Major-General George W. Goethals. Among the distinguished gentlemen who have accepted invitations are Hon. James M. Cox, governor of Ohio, Chas. M. Schwab, Major-General Leonard Wood, and others equally well-known.

Mr. Harry Morlan has been appointed manager of the Mackay Telegraph and Cable Company at Fort Worth, Texas, coming from Salt Lake City, Utah. Prior to going to Salt Lake he was manager of the Kansas City Board of Trade office for eleven years, and was presented with a watch and charm by the board members on his departure. He also received a diamond stud from the Kansas City force. Mr. Morlan is very popular, and is glad to get to Texas. He started his career as a messenger, and worked hard, but received no compensation other than the opportunity to learn telegraphy. He has had thirty-five years' experience in the telegraph service as operator and manager, and is very progressive.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Officials Returned.—Messrs. Newcomb Carlton, president; L. McKisick, assistant to the president; W. N. Fashbaugh, vice-president, Traffic Department; G. M. Yorke, vice-president, Plant Department, and E. Y. Gallaher, vice-president, Accounting Department, who left New York, January 8 on an inspection trip to San Francisco, Cal., returned February 5 to their respective offices. While absent they visited Chicago, St. Louis, Kansas City, Albuquerque, Flagstaff, Los Angeles, San Francisco, San Diego, Riverside, Colton, San Bernardino, Redlands, Tucson, El Paso, San Antonio, Dallas, Houston, Galveston, New Orleans, Memphis and Louisville.

Mr. J. C. Willever, vice-president, commercial department, who has been in Havana, Cuba, on company business for the past two weeks, has returned to his office.

Mr. Wm. H. Baker, formerly secretary of the Western Union Telegraph Company, New York, is now in Florida, where he will remain for a month.

Visitors. — Among the recent executive office visitors were Mr. Chas. Smith, manager of the Louisville, Ky., office, and Mr. Chas. E. Thatcher, manager of the San Francisco office. Both officials were in New York on business connected with the service.

Mr. F. B. Travis, formerly of Boston, Mass., and for the past two years located at Chicago, has been advanced to the position of district commercial agent of the first district with headquarters in the same city.

Mr. E. C. Labadie, division traffic supervisor, Denver, Col., has been transferred to the Pacific Division, with headquarters at San Francisco, as division traffic engineer.

Morse Club Dinner.—The dinner of the Morse Electric Club is scheduled to take place at the Hotel McAlpin, New York, at the time this issue is being printed, February 15. The event will be fully covered in our March 1 issue.

Mr. J. L. Ferciot, manager of the Omaha office of this company, related the "Story of the Telegraph" before a large audience at Hammill College, Council Bluffs, Iowa, January 16.

Old Telegraph Company Dissolved. — The Illinois and Mississippi Telegraph Company has been dissolved at Ottawa, Ill., and its assets taken over by the Western Union Telegraph Company.

Mr. Frank R. Veale has been appointed district commercial superintendent of the first district, Southern Division, with headquarters at Richmond, Va. Mr. Veale was born in Norfolk, Va., in January, 1886, and entered the service of the Southern Bell Telephone Company at Fort Monroe in August, 1899. In January, 1902, he took a position as operator for the Western Union and became manager at Fort Monroe. Afterward he filled the positions of relief manager, wire chief, chief operator, division cable manager, and assistant superintendent, and became district commercial manager of the sixth district, August 1, 1915. His appointment as acting superintendent of the first district soon followed and he was later made superintendent. Mr. Veale is one of the youngest superintendents in the service.

FRANK R. VEALE.

Character.—"Character is the supreme requirement for success," said President Newcomb Carlton, in referring to the new course of studies prepared for the employes of the Western Union Telegraph Company.

"Training alone will not suffice. We are trying to develop men as well as clever brains and skilled hands. Wherever we find a man who is struggling to get ahead, there is the man we want to help. More than that, we are trying to arouse the average man to a desire for success. Perhaps he has never had a chance, has not been strong enough to create one for himself, but only needs encouragement to make the effort.

"Pride of service! Instill that into an employe and you are not only making him efficient—you are making a man of him. In work there is a glory that comes from nothing else. Make the employe feel it, make him know that he is an individual, a vital link in the chain."

C. H. Gaunt's Comments on the Business Situation.

General Manager C. H. Gaunt, of the Western Union Telegraph Company, is proud of the achievements of his company during the year just closed and has no worries for the future, says the *Chicago Eagle.*

"My company," said Mr. Gaunt, "is a first disciple of preparedness, which is the only safe and sane foundation of optimism. During the past one and one-half years," he continued, "railroads, steamship lines and other public utilities have been all but swamped by a tidal wave of abnormal business. Western Union was industrially prepared for this onrush, and the needs of the hour brought forth from our experimental laboratories the multiplex, a machine which manually transmits and types eight messages over one wire at the same time. This electrical marvel has increased the carrying capacity of our circuits 400 per cent. and in connection with other forces held in reserve has enabled us not only to handle the avalanche of business normally developed, but to reach out systematically for more. In spite of traffic increases ranging from 25 per cent. to 100 per cent., transmission standards actually have been bettered and we have found time to develop among our 25,000 employes scattered throughout the country, one of the greatest business-getting organizations of the present day.

C. H. GAUNT.

"Western Union is industrially prepared for the conditions that will follow the end of the war. Seizing advantage of the present business activity, we have conducted a nation-wide educational campaign to convince the busy business man of the time-saving and attention-compelling properties of Western Union telegrams in the belief that, having learned the value of this utility, he will not be content to go back to slower methods of communication formerly used. When business is moving rapidly the telegraph is a necessity for the man who would keep pace with his competitors. When business is poor, competition is keener, and the slight saving in cost by use of the slow moving mails as against the telegram which goes quickly and directly to the party addressed, may mean the difference between a sale lost and a sale made. In either event we stand to win."

The Western Division, of which General Manager Gaunt is the head, comprises ten states contiguous to Chicago. One-third of the company's receipts are said to come from this territory, and Chicago is called the greatest wire center in the world. A network of wires radiating in every direction gives Chicago direct connection with every city of importance in the United States. More than 2,500 operators are employed in the local office and 75,000,000 messages are handled annually.

New Office at Peoria, Ill.

The new office of the Western Union Telegraph Company at Peoria, Ill., was opened for business January 27, the old quarters in the Board of Trade building having been occupied for forty years. The first office of the Western Union Company was on the second floor of a building, but when the company absorbed several other telegraph companies the office was moved to the quarters just vacated.

H. C. Ranney was the first manager. He had one operator, who acted also as clerk, and two messengers. Today the force consists of forty people and thirty-five messengers, and there are four branch offices in the city. Mr. Ranney died in 1881 and was succeeded by John McRobie, who remained in charge until 1883. B. H. Griffin relieved Mr. McRobie and continued as manager until 1894. After then, until 1904, Edward Adams and R. C. Baker were managers successively, the present head, William Howard, assuming the management October 1, 1904. The new office is modernly equipped throughout and is said to be one of the finest of any place of equal size in the country. Among the equipment are two quadruplex, two duplex and thirteen repeater sets. It occupies the first and second floors.

On the first floor are located the telephone, delivery and bookkeeping departments. The traffic, testing department and motor-generator sets occupy the larger part of the second floor. Space is also provided on this floor for men's and women's rest rooms. The messenger boys have quarters in the basement, where lockers, toilets and shower baths have been provided.

Western Union Educational Society.

The second general meeting of the season of The Western Union Educational Society of New York was held at 24 Walker Street on the evening of February 9 and was the most largely attended gathering the society has yet held. There were about 900 persons present, at least half of them being ladies. It seemed like a large family gathering and everyone was in the happiest mood.

Mr. S. B. Haig, president of the society, was in charge of the entertainment. He announced at the opening that on account of a cold which kept him confined to the house, Mr. T. W. Carroll, general manager, would be unable to be present, as announced on the programme. Mr. Earl Askam, of the operating staff, consented to fill the gap with a song which he rendered very ably and artistically. Mr. Askam was in the war ambulance service in France last year and is expected to give an account of his experiences at the next meeting of the society.

Mr. L. C. Boochever made a few remarks on the work of the society. He urged every one to become a member, as the organization is outlining some big things for the near future. Flourishing societies, patterned after the New York organization, are now maintained in Boston, Philadelphia, Baltimore, Washington and Pittsburgh. Where employes get together greater co-operation exists between the members of the different departments. Loyalty, he said, is the most wonderful stimulant that the modern business world knows, and asked his hearers to put it into practice and thus demonstrate the fact for themselves.

He spoke of the important part the telegraph would have to play if the country should ever have to defend itself. Loyalty to the company in times of national danger, he said, means loyalty to the government.

A one-act comedy entitled "Lost and Found Bugs" was next given. It was very humorous and well played. It was written and produced by Francis J. Boss, Jr., and directed by T. Skidmore.

At the conclusion of the act, the floor was cleared and dancing followed until 11 o'clock.

The Western Union orchestra rendered excellent music and each member seemed to be a master of his own instrument, so well were the different selections played.

On the whole the affair was of pleasing character, and reflected the good the society is performing among its members. Messrs. S. B. Haig, G. E. Palmer, L. C. Boochever and others rendered great assistance in making the meeting so successful. All of the entertainment was furnished by home talent.

Mr. George Iles, one of the leading American inventors, in a letter to D. H. Bates, thanking him for a copy of the annual proceedings of the Old Time Telegraphers and Historical Association and of the Society of the United States Military Telegraph Corps says: "The portraits form a gallery worthy to be preserved and treasured. I am glad that a picture of the old Vail place at Morristown was included. There were laid the foundations of American telegraphy."

THE CABLE.

Censorship in Japan.—The Japanese administration announces restrictions of the censorship and that all messages must be signed with the proper name of the sender. No abbreviated code or cipher names will be allowed.

Cable Dividend.—The directors of the Central and South American Telegraph Company and of the Mexican Telegraph Company have declared stock dividends of 46 per cent. for the Central Company and 39 per cent. for the Mexican.

Foreign Transfers by Cable.—Banking and exchange business between London and America, as well as the Scandinavian and other neutral countries, has been carried on largely for some time by means of telegraphic transfers, owing principally to interruption of the mails.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to February 12, 1917, as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable), October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917.

CANADIAN NOTES.

J. G. Taylor, aged fifty-five years, general superintendent of the Canadian Pacific Railway for Saskatchewan, died in Edmonton, February 5. Mr. Taylor, as well as being general superintendent on other divisions of the company, rose through the ranks of operator, dispatcher, superintendent, etc., and was a very popular and well liked official.

GREAT NORTH WESTERN.

The night letter business is increasing very rapidly in Toronto. On Monday, January 15, 5,000 night letter telegrams were handled and cleared by 3 a. m., and on January 22, 5,000 messages of 174 words each were dispatched with ease and much credit to the force.

The office at St. Catherines, Ont., was destroyed by fire recently. Manager Friezell promptly secured quarters next door and there was little delay to business.

THE TELEPHONE.

Mr. J. J. Carty, chief engineer of the American Telephone and Telegraph Company, has been appointed senior major in the Signal Officers' Reserve Corps, by President Wilson. This corps is the reserve auxiliary of the Signal Corps of the army and will be called into service in times of war.

MR. F. H. BETHELL, president of the Bell Telephone Company of Pennsylvania and its associated companies, has been appointed by Governor Whitman, of New York, as the member from Westchester County of the Bronx Parkway Commission. Mr. Bethell resides in Scarsdale, N. Y., and is the president of that village.

HENRY S. HYDE, aged seventy-nine years, for many years a director and vice-president of the New England Telephone and Telegraph Company, died at his home in Springfield, Mass., February 2. He was an organizer of the Springfield Telephone Company in 1879.

APPOINTMENTS IN PENNSYLVANIA BELL COMPANY.—The following appointments have been made recently in the Bell Telephone Company of Pennsylvania and associated companies: J. L. Kilpatrick, engineer; C. Reutlinger, division superintendent of plant, Philadelphia Division; J. W. Hubbell, engineer of equipment and buildings; F. T. Ewing, supervisor of traffic; F. B. Evans, Jr., traffic engineer; M. H. Orth, division superintendent of traffic, Pittsburgh Division, the present Pittsburgh and Pittsburgh Elsewhere Divisions of the traffic department having been consolidated.

BRAVE TELEPHONE OPERATOR REWARDED.—Miss Tessie McNamara, telephone operator of the Canadian Car and Foundry Company at Kingsland, N. J., recently wrecked by an explosion, has been given a gold watch and a purse of gold from the Maryland Casualty Company, which had insured the plant employes under the workmen's compensation law. Miss McNamara saved the lives of the employes by sticking at her telephone switchboard at the risk of her life and sending repeated warning over the wires as she watched the spread of the flames to places where high explosives were stored. Through her bravery every one in the plant got out safely.

RADIO TELEGRAPHY.

Marconi Notes.

MR. E. J. NALLY, vice-president and general manager of the Marconi Wireless Telegraph Company of America, New York, has returned from Montreal, where he attended the quarterly meeting of the directors of the Canadian Marconi Company.

MR. JOHN BOTTOMLEY, vice-president of the Marconi Wireless Telegraph Company of America, New York, returned to his office February 6 from a vacation spent in the South. He was accompanied by Mrs. Bottomley.

MR. DAVID SARNOFF, commercial manager, has returned from Washington, where he spent several days on business of the company.

HEARD AUSTRALIA BY WIRELESS.—Operators at the new naval radio station at Chollas Heights, in California, which was opened recently, talked with the Arlington station and the stations at Darien, Panama, Nome, in Alaska, and Honolulu on January 28. They overheard French on the Island of Papeete, South Pacific, and concluded by exchanging the time of day with operators at a radio station near Melbourne, Australia.

RADIO INSTITUTE MEETING.—The February meeting of the Institute of Radio Engineers was held in the Engineering Societies Building, New York, Wednesday evening, February 7. A paper on "The Influence of Commercial Conditions on Transmitter Construction" was presented by Mr. Julian Barth. Mr. Barth described four interesting types of radio transmitters, including cargo ship sets, special land station sets and moderate high-power land station sets.

Marconi Organization and Personnel Placed at Government Disposal.

On Saturday, February 3, immediately following the published announcement of the break in relations with Germany, Mr. Edward J. Nally, vice-president and general manager of the Marconi Wireless Telegraph Company of America, telegraphed President Wilson, placing at the disposal of the government, for use in any emergency, the entire organization and personnel of the Marconi Wireless Telegraph Company of America, including its high-power stations at Marion and Chatham, Cape Cod, Mass.; New Brunswick and Belmar, N. J.; Bolinas and Marshall, Cal., and Kahuku and Koko Head, Honolulu, Hawaii. Also its coastal stations (some sixty in number) located from the most northeasterly point on the Atlantic Coast to and along the Gulf, and the entire Pacific Coast to northern Alaska, and on the Great Lakes; also its manufacturies, workshops and trained staff, subject to the orders of any particular department of the government which may need its services.

OBITUARY.

JAMES M. DRIVER, of Narrowsburg, N. Y., an old-time telegrapher and a member of the Old Time Telegraphers and Historical Association, died at that place on January 31.

WILLIAM HENRY, operator for the Western Union Telegraph Company, died in Council Bluffs, Iowa, January 25. He had worked in the Omaha, Neb., office for twenty-seven years.

J. P. MCCABE, aged fifty-six years, manager of the Walnut Hills District Telegraph Company, Cincinnati, Ohio, died January 28. For several years he was chief operator of the Cincinnati office of the Western Union Telegraph Company.

HARRY L. GREGG, aged eighty-two years, who for more than forty years was manager of the Western Union branch office at the New York Central Railroad station at Rochester, N. Y., died in that city, January 28. He was a member of the United States Military Telegraph Corps during the Civil War.

H. G. STOTT, aged fifty-two years, superintendent of motive power, Interborough Rapid Transit Company, New York, and a past president of the American Institute of Electrical Engineers, died at his home in New Rochelle, N. Y., January 16. He was a native of Scotland and a widely known electrical engineer. He was for several years assistant electrician on the cable ship "Minia" of the Anglo-American Telegraph Company, and aided in the duplexing of the company's main cable.

Government Ownership of Wireless.

The new legislation proposed for the regulation of radio communication, and apparently designed for government ownership and control, is being vigorously pushed forward by the Navy authorities at Washington, and the matter is now in the hands of the Committee on the Merchant Marine and Fisheries.

"The bill," says Secretary Josephus Daniels, of the Navy Department, "covers the purchase of coastal stations only, that is, only those used to communicate with ships, and, by permitting the Navy Department to open all of its stations to commercial business, discourages the extension of any existing commercial systems or the organization of new systems.

"The department strongly recommends that the committee provide for the purchase of all stations used for commercial purposes. In some cases the status of existing stations is constantly changing, and decisive action at this time will result in a saving of public funds."

Mr. Daniels explains that the Navy Department "is convinced that government operation and control of all stations used for commercial purposes, other than those on board merchant ships, is necessary on account of the mutual interference between stations.

"One station or system," he says, "must wait for another to finish; there are many chances for disputes which sometimes are carried on between operators by radio, especially when the operators are not under strict control, adding to the time wasted; there is needless duplication of effort, and in cases of distress the confusion resulting from many interests attempting to render aid, get news, or satisfy curiosity, is very dangerous."

Secretary Daniels stated informally that he was firmly convinced that government control of wireless is absolutely necessary to the best interests of the nation. "I deem the matter most urgent," he said. "Delay only will increase the difficulties under which we are working; delay also will mean an increased outlay to the government when the step finally is decided upon."

Mr. E. J. Nally, vice-president and general manager of the Marconi Wireless Telegraph Company of America, replied to these remarks, practically covering the same ground gone over in the article published in our January 16 issue.

On January 18 Mr. Nally appeared before the committee in Washington and further supported the arguments of his company that government ownership is impractical. He drew attention to Section 5 of the bill which provides for the opening by the government of its radio stations to general public business, and noted that if this provision is enacted into law, it will create a condition of competition between government and private interests, resulting in a heavy financial loss to commercial companies, which have spent considerable sums of money and years of labor in the development of efficient radio stations, so as to provide a satisfactory commercial wireless telegraph service to the public.

"Much has been said during the hearing given by this committee to the proponents of this bill," he said, "about the willingness, even the anxiety, of the commercial companies to dispose of their coastal stations to the government.

"So far as the Marconi Company is concerned, no one has been authorized to make any such statement and I can only think that, with the Navy Department, the wish is father to the thought.

"The Marconi Company's principal business is that of selling service. While it does manufacture some apparatus for sale, yet this branch of its business is merely collateral, and is not its principal object, which, I repeat, is to sell service.

"For this reason it does not sell apparatus to ships, but it sells ships certain service for a certain sum per month, just as the telephone company, or electric light company, sells it service to a customer.

"In order to give perfect service and to make the apparatus which it installs on ships serviceable in the greatest degree, it has erected and maintains land, or coastal, stations, from the most northerly point on the Atlantic Coast to the most southerly point; also on the Gulf, on the Great Lakes, and on the Pacific Coast north to Alaska.

"These stations were erected, and are maintained, as the essential, indeed, vital link in ship and shore service, and the long list of rescues at sea, and of lives and property saved because of the ready response which ships in distress at sea have been able to obtain by reason of these coastal stations, co-operating with other ships at sea, makes a long and honorable record, of which any company may well be proud. And this tremendous service in the salvation of life and property, already rendered by wireless, has earned for it at least the right to be developed and made useful and available to the fullest possible extent.

"Such development can only come through private enterprise," he insisted. "It is impossible to formulate legislation which will foresee and provide for the future usefulness of radio communication. If the Navy Department had been given a monopoly of the telephone, when that means of communication was first developed, would the United States today have, as it has, the greatest telephonic development of any country? And yet the telephone has not supplanted the telegraph. It occupies an entirely new field created for it by the persistence of private enterprise.

"From every possible point of view," said Mr. Nally, "there is not a sound reason for placing the government in the commercial radio business. There are controlling reasons of every character why this should not be done."

In closing, Mr. Nally asked the committee to consider that it is a matter of record that the Marconi Company has repeatedly offered to place at the disposal of the nation, its stations and its operators, "even going so far," he noted, "as to secure from its operating personnel, individually signed expressions of readiness to enter government service in event of war, which records were all turned over to the Navy."

The best thought of the telegraph profession is expressed in TELEGRAPH AND TELEPHONE AGE.

Wireless Telegraphy.*

BY E. B. PILLSBURY, GENERAL SUPERINTENDENT, MARCONI WIRELESS TELEGRAPH COMPANY OF AMERICA, NEW YORK.

The history of wireless telegraphy repeats once more the old story that is so often connected with great inventions. The world being possessed of a new scientific principle, many minds in many parts of the world are simultaneously bent upon its practical application, with the result that the fundamental principle finds embodiment in various methods of accomplishing a similar purpose. The startling nature of the discovery of electric waves was bound to give rise to unprecedented activity in the field of experimental investigation, and such experiments as were particularly successful were bound to prompt investigators to seek patent protection on their modifications, and this in turn gave rise to several systems of radio-telegraphy.

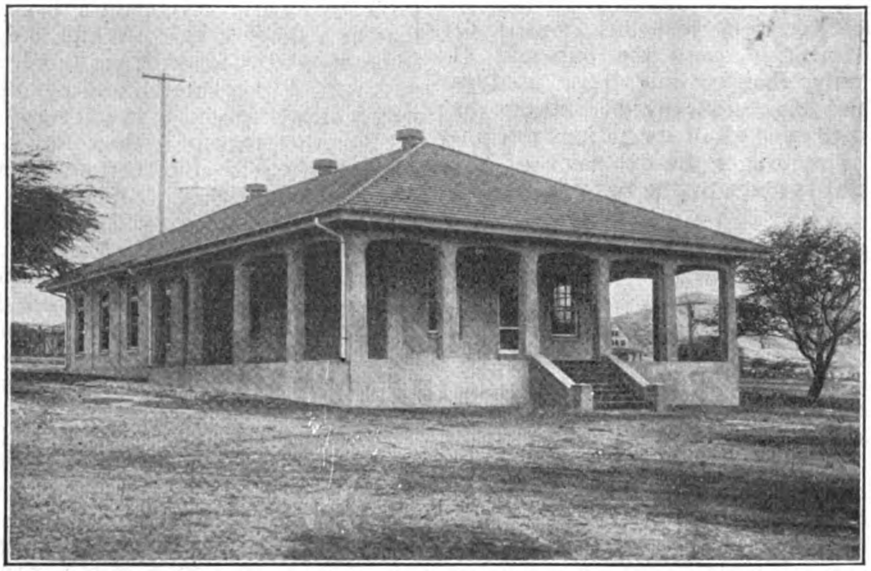

FIG. 1—TYPE OF OPERATING BUILDING OF MARCONI STATIONS.

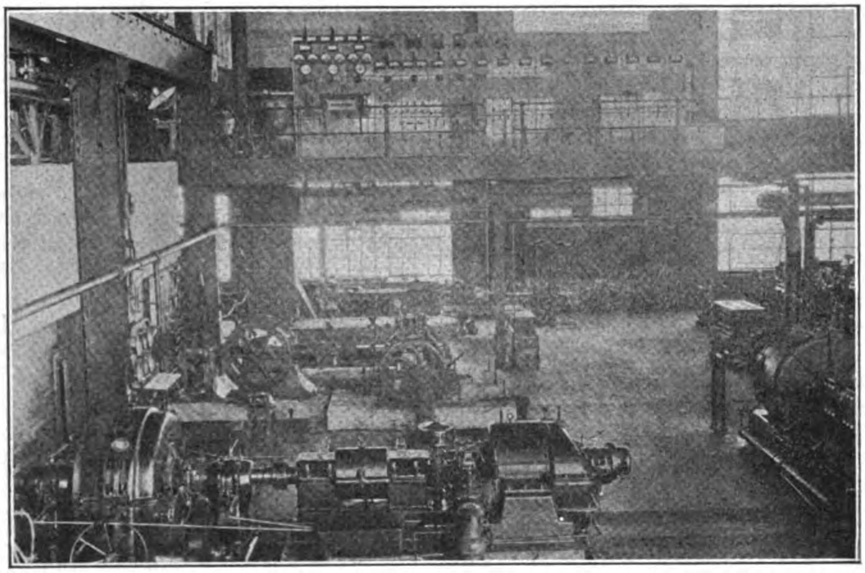

FIG. 2—500-H. P. STEAM TURBINES AND GENERATORS IN MARCONI POWER PLANT.

A voluminous list of names could be given of those who have contributed to the advancement of radio-telegraphy in regard to both theory and practice. Among the best-known American investigators are Fessenden, Shoemaker, De Forest, Clark, Stone and Massie. Each of these men has devised a system which bears his name. In England, the work has been carried on by men of such unqualified distinction as Lodge, Alexander Muirhead, Fleming, Thomson and Rutherford. Slaby, Arco and Braun are the names best known in Germany. The French are represented by Ducretet, Branly, Rochefort and Tissot, besides other men of lesser fame. Italy has contributed largely to the subject, principally through Marconi, Bellini, Tossi and Righi. Denmark is represented by Poulsen. Spain, Austria, Belgium and Argentina have all produced systems which have been more or less used in their respective countries. The Japanese have also devised a system that successfully stood the test of service in the Russo-Japanese War.

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*International Cable Register.

The development of the art in the various countries has been carried on largely by representative investigators, and in many instances the governments have adopted a system exploited by their subjects. The United States government, however, has experimented with most of the prominent systems offered, and, as a result, the army and navy equipments are comprised of quite a variety of apparatus of different inventors.

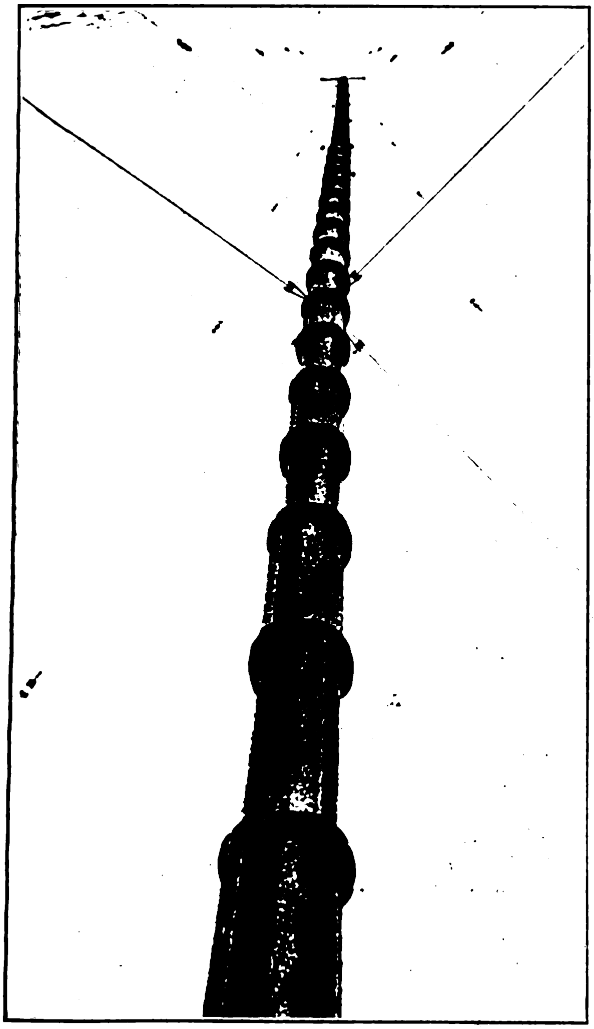


FIG. 3—450-FOOT TUBULAR MAST.

Wireless telegraphy was the subject of earnest experimentation as early as 1838, but, as far as the public mind is concerned, the science began when Marconi sent his first message across the Atlantic from Cornwall to Newfoundland in 1902. This wonderful accomplishment had so much of the spectacular element in it that wireless telegraphy and Marconi became famous at once and, measured by results, Marconi has eclipsed all other wireless inventors.

Marconi first interested himself in the problem of wireless telegraphy in 1895. In the following year he took out the first patent ever granted in England for a practical system of wireless telegraphy by the use of electric waves. In 1897 he successfully communicated across Bristol Channel, a distance of nine miles. At the invitation of the Italian government, Mr. Marconi subsequently went to Spezia, where his system was put to practical test on board two Italian battleships. A station was erected on land, and the ships were kept in constant telegraphic communication with the shore up to a distance of twelve miles. Returning to England he made further experiments and succeeded in communicating between Salisbury and Bath, a distance of thirty-four miles.

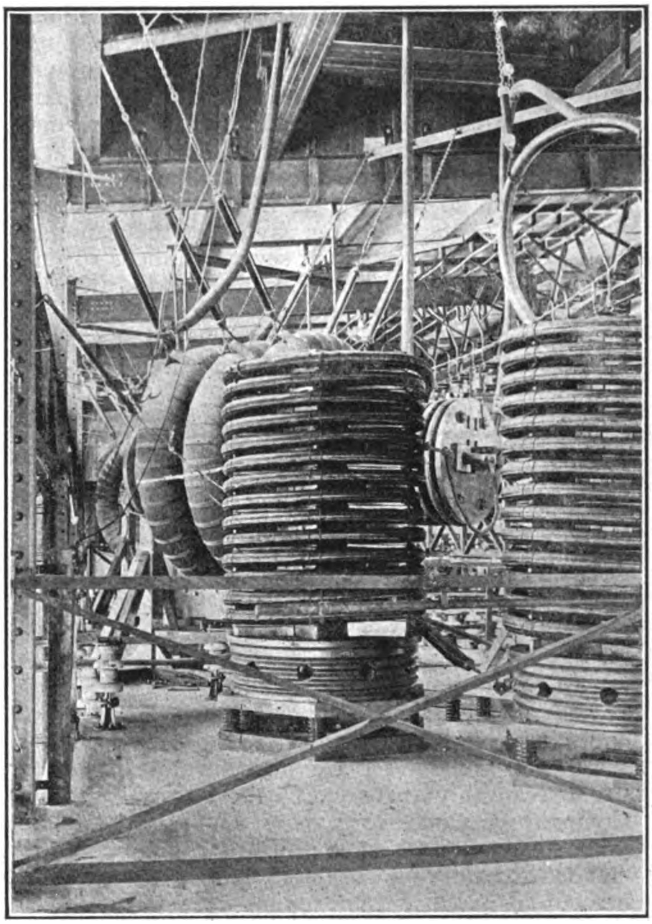


FIG. 4—OSCILLATION TRANSFORMERS AND AERIAL INDUCTANCES IN TRANSMITTING STATION.

Mr. Marconi came to the United States in 1899, in connection with the America yacht cup race between "Columbia" and "Shamrock I." In the same year a number of ships of the British navy were equipped with his apparatus. Early in 1901 telegraphic communication was established between two points more than 250 miles distant. In February, 1902, he received, on board the steamship "Philadelphia," in the presence of the ship's officers, good messages on a recording tape when at a distance of over 1,500 miles from the transmitting station. In December, 1902, he established a station at Cape Breton for transatlantic service, and maintained communication with the Cornwall station at Poldhu, transmitting inaugural messages to the King of England and the King of Italy, the London *Times* and others. A year later, during the voyage of the steamer "Lucania," Mr. Marconi maintained communication between the ship and the Marconi station at Glace Bay, in Cape Breton, and Poldhu, in England, and a newspaper was published and issued daily to each passenger. A powerful station at Clifden, on the west coast of Ireland, was opened early in 1907, by means of which public communication across the Atlantic was established, which has been maintained ever since.

The importance of wireless equipment of sea-going vessels has been recognized by all nations, the United States law requiring two licensed operators on any ship carrying fifty or more persons and sailing between ports 200 or more miles apart. It is estimated that upward of 5,000 ships are now equipped, and a large number of freighters carry wireless for their own protection, although not required to do so by law. In fifteen years, wireless has placed to its credit the saving of thousands of lives and property valued at several millions of dollars. It is an inestimable boon to mankind that we can go to sea with the knowledge that we are kept in touch with home and can summon aid in case of disaster by means of the S. O. S. signal.

Out of shipwrecks in the last decade has grown a tradition that wireless operators may be depended on absolutely in times of peril. A grateful world remembers their services in connection with the "Republic," the "Titanic," the "Empress of Ireland," the "Lusitania" and other ill-fated ships. They have amply demonstrated their high conception of duty and their readiness to respond to the call of humanity when the lives of others are at stake. In no case has an operator been found wanting in fidelity, courage and forgetfulness of self. The records of all operators who lose their lives in the endeavor to save others, as well as those who, without sacrificing their lives, are instrumental in saving life at sea, are perpetuated by the English Marconi Company on panels in Marconi House, in London. Near the sea wall in Battery Park, New York, stands a handsome granite shaft and fountain erected by popular subscription as a memorial to these brave men and faithful souls. It was conceived during the time when the world was recovering from the shock of the great tragedy of the "Titanic," and stands today as a perpetuation of their great service.

The Longest Regular Circuit in the World.

Mr. George W. Conkling, the winner in many telegraph tournaments, is working the overland leased wire for E. F. Hutton and Company from New York to San Francisco, with loops to various points. His sending reaches the furthest end of the wire in first-class shape. The circuit runs from New York, by way of Buffalo, Chicago, Denver, Colorado Springs, Salt Lake, goes over to Butte and Spokane, from Salt Lake to San Francisco, Los Angeles, Pasadena and Coronado. New York sends direct on a duplex to all of these points; Salt Lake relays business from Spokane and Butte to New York; San Francisco relays business from Los Angeles, San Diego and Pasadena to New York, but New York sends direct to all these different offices. The circuit is 5,800 miles in length and works like a short circuit. The average loss of time for months has not exceeded thirty minutes per month. There are repeaters at Buffalo, Chicago, Denver, Salt Lake, San Francisco and Los Angeles. This is probably the longest circuit in the world worked regularly.

Shop Talk.

BY THE OBSERVER.

(Continued from page 59, February 1)

Now that I have mentioned the importance of watching the adjustment of the relay-magnet position and the retractile spring, see that the armature is hanging at an angle of ninety degrees (straight up) and not laying forward or backward at an angle of ten or fifteen degrees, which, when the relay is "closed," would show the armature lying too much to the right or left. Sticking of the relay is often caused by the armature being out of its proper position, or binding in its trunnion (the side set-screws). A simple test with the eye and hand will reveal either fault. The proper play of a single line Morse relay armature may be obtained if the space between the back stop and contact point is just sufficiently wide to permit the make-and-break so that the sounder responds clearly. If too close it will cause a stick; if too wide, a drop out. It is not necessary that you be a skilled electrician or mechanic to accomplish these adjustments.

Suppose that you have the relay adjusted perfectly and still the characters, outgoing and incoming, are not properly heard on the sounder. There is a small wire at the bottom of the relay, usually a little green or brown spiral. This small wire is placed there to reinforce the local "battery" circuit, that is, to reduce the contact or resistance between the battery and sounder, and if this wire is loose or broken the relay armature in its transit causes it to be in circuit one moment and out of circuit the next. Hence the sounder current changes every few moments and in consequence you hear one letter loudly, the next one weakly. See that this small wire is in its place and that it is tight under the two small screws. Often, with all of these suggestions properly attended to, the sounder does not work properly. Be sure that the sounder responds in a clean-cut way when you work the relay armature with your key, or by working the relay armature with your hand. Unless it does so, first see that the armature does not touch the magnets. You can test that by placing a blank under the sounder armature and closing the local circuit, or by pressing down on the sounder armature. If there is any binding between the paper and the sounder armature, raise the armature away from the magnet until the paper works freely. This is done by a movement of the set-screw.

Be sure that there is no hole worn underneath the lower stop post of sounder. If there is, and it cannot be filled or filed out, replace with a good sounder.

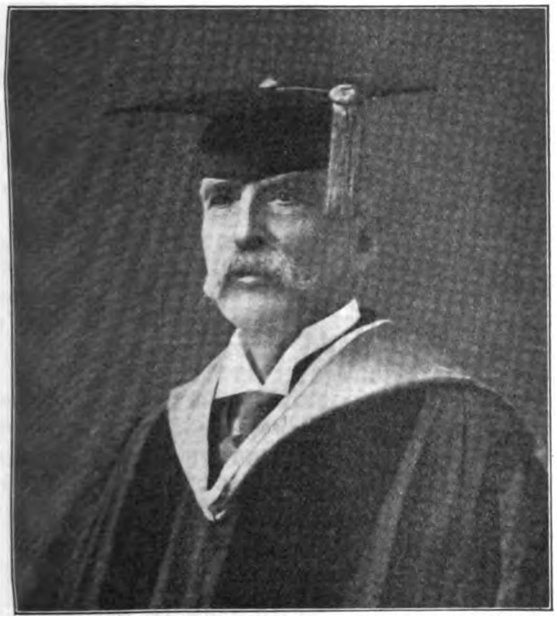
(To be continued)

George Kennan and the Phillips Code.

(FROM THE BOSTON HERALD.)

I sat beside George Kennan at dinner the other night and as I talked with him I could not fail to be impressed with the educational value which certain careers have, and of the element of accident besides in all human affairs. People know him from his disclosures of the tyrannical conditions of the Russian exile system which he made more than thirty years ago, and since that time as a staff correspondent of the *Outlook*. But how did he get to Russia, or into line for such a commission?

Did you ever hear of Phillips, the author of the Phillips code, which telegraphers use? Under it "scotus" stands for "supreme court of the United States"—the letters "qp" mean "on the part of," and so on. Well, this man turned the switch which sent George Kennan down the journalistic track. Born in Ohio in 1845, and enjoying but scanty schooling, young Kennan learned telegraphy, and when only twenty years old was sent by the Western Union Telegraph Company to work in the middle division of the Russian-American Telegraph line. This gave him his first acquaintance with the empire of the Czars and its language.



GEORGE KENNAN IN THE GARB OF A DOCTOR OF LITERATURE, A DEGREE CONFERRED BY THE ROCHESTER UNIVERSITY.

When Kennan came home he began to do lecturing. He found at the same lecture bureau Phillips, also a telegrapher, who was invited soon after to go to Washington to take command of the old Associated Press. He asked Kennan to go along with him to report the doings of the supreme court. Kennan demurred, saying he was not a newspaper man, had no training in law, and would not know how to handle the decisions of that august tribunal. Phillips answered that Kennan could not know less than the man who was then doing it, and would have the affirmative advantage that he did know how to write.

Young Kennan continued this work for several years. He was finally authorized to take notes in court, something which had long been forbidden, and he made a practice of studying briefs as they came in, and listening to the arguments, so that when the decisions actually came, he could sense their importance.

With his subsequent career, his journeys, his explorations in Russia and Siberia and the Caucasus, his going to Japan and to Cuba and to Martinique as a representative of the *Outlook*, the world is reasonably familiar. He had written "Tent Life in Siberia" in 1870 when just twenty-five years old, a book which indorses what Phillips had said of his young protege's ability to write as the first requirement for handling the decisions of the supreme court.

Referring to the foregoing, Mr. Phillips writes as follows to TELEGRAPH AND TELEPHONE AGE:

"Mr. Kennan was a brilliant success as the condenser of the decisions handed down by the Supreme Court. At one time and another he was complimented on the accuracy of his work by every judge on the bench during the several years he was in the service of the Associated Press. His work during President Garfield's fatal illness, both as a writer and telegraph operator, was of the very highest grade. In every field of journalistic work in Washington in which he engaged, Mr. Kennan was in perfect touch with his environment. and a notable success in divers places, when even the ablest of the Washington correspondents were far from being completely triumphant.

"He was the first, aside from the telegraphers, to use my code as a substitute for shorthand. Since then thousands of men have adopted it for general reporting. It was Mr. Kennan who attended the funeral of Ebon C. Ingersoll and made a vivid report of the ceremony. His dispatch included the beautiful tribute to his dead brother, spoken by Robert G. Ingersoll, the distribution of which to the hundreds of newspapers publishing the Associated Press service, did more to make Colonel Ingersoll's name a household word than even his electrifying speech putting Blaine in nomination for the presidency, and his stirring reference to the White Plumed Knight, great Henry of Navarre.

"Mr. Kennan and Mr. Edison were born within a few miles of each other, the former at Norwalk and the latter at Milan, Ohio, and though both were in the telegraph business in early life they did not meet until they were brought together recently at the annual dinner of the Ohio Society. Mr. Kennan was asked to say a few words to Mr. Edison on the instrument that had been set up, and he did so in as rhythmic tempo as when he won his spurs as a beautiful sender more than fifty years ago."

STUCK TO HIS POST.—Mr. George Z. Taylor, Associated Press operator in the office of the Waterbury, Conn., *Republican*, stuck to his post under trying conditions during a fire in an adjoining building recently. Reporters and editors fled to another room because of the deluge of water from the burning building, but Mr. Taylor stuck bravely to his instruments and typewriter. His action was warmly commended by the Associated Press officials at New York.

Efficiency Engineering in the Telegraph Service.

(Continued from page 65, February 1.)

The grouch is not a success because it is not in the nature of things that he should be. Such a man is perhaps a pronounced type of one who is unpopular. When people seek to "get back" at him, they strike at the interest he represents and for that reason the business that is entrusted to him suffers, although it is probable that he is the last man to believe that he is in any way responsible.

Patience, not grouchy methods, should be the watchword of every telegraph and telephone employe. In these days the public will not tolerate anything short of politeness. The officials of the company soon realize the cause of a falling off in business or prestige in any office and they are quick to apply the remedy. It may be a transfer of services to some other place where it will again take some time to exhibit one's shortcomings or it may be a dismissal from the service. If the former, every opportunity should be embraced to make amends for previous failures.

Recently a New England Westinghouse official prepared and published in the house organ of the company the following business principles which he hoped those in the service would study to their profit. They were:

ACCURACY.

We believe in accuracy in all our acts, statements, reasoning, workmanship, appointments, promises, drawings; in fact, in everything that is associated with our name.

VERACITY.

We believe in veracity towards our associates, superiors, subordinates, clients, competitors, beggars, benefactors, members of our family, and especially towards our own conscience when it is accusing us.

FULFILLING A PROMISE.

We believe that fulfilling one's promises in spite of all obstacles and against one's own advantage is the greatest single asset and virtue in business.

INITIATIVE.

We believe in initiative, which in the business world usually means helping everyone around you without being asked to do so and without being obnoxious.

SYSTEM, ORDER AND SELF-DISCIPLINE.

We believe in system, order and self-discipline for the sake of those with whom we are associated. This is but a specific case of the Golden Rule and it works fine. We do not tax our memory beyond reason, because an omission or a misstatement may hurt a friend of ours.

HARMONIZING VIEWS.

We believe in harmonizing views whenever possible and in foregoing the mention of a distinct name for the sake of friendship with those to whom this name may be offensive.

BEING OPEN-MINDED.

We believe in being open-minded, because we remember many a case when we were glad that things did not happen our way and sorry when they happened the way we wanted them to.

GIVING FULL CREDIT TO OTHERS.

We believe in giving full credit to others, because real worth cannot be hidden long and a professional thief is not a very far-sighted individual.

CO-OPERATION.

We believe that a lasting monument is usually a result of wise and unselfish co-operation wherein everyone works on the part he is best fitted for and is so busy and interested in the work that he forgets to hew his name on the stone.

KEEPING SUPERIORS POSTED.

We believe in keeping our superiors posted on what we are doing, so as to simplify their supervision over us. Having finished a task we report at once, or if the job could not be done we notify the head man without delay. We train our boss so that when he does not hear from us he knows that everything is O. K.

SURPRISES SHOULD NOT BE SPRUNG.

We believe that no surprises should be sprung on our business associates in the form of an unexpected official act or letter. It is both wise and honorable to discuss a matter with a person informally and to find his attitude towards it before taking a decisive step.

PERSUASION RATHER THAN COMMAND.

We believe in persuasion rather than command for the same reason for which we prefer an electrically-started automobile. Incidentally, the most efficient organizations are those in which men understand what they are doing and believe in the method of procedure.

MOBILIZING RESOURCES.

We believe in mobilizing the resources of our organization when an important problem arises. We see to it that those whose skill or knowledge exceeds ours are drawn into the discussion and not kept out for a selfish purpose.

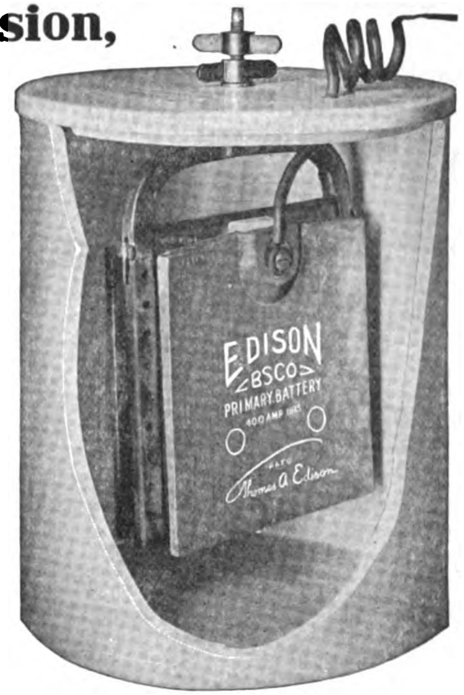
(To be continued)

Significant Names.—In a list of the names of employes in a large telegraph office in the South these appear: Brown, Gray, Black, White, Berry, Butler, Farmer, Grace, Gross, Hamm, Jack, King, Knight, Lawless, Puff, Rust, Shepherd, Silver, Stone, Summers, Swann and three plain Smiths. In a western office there is a Bard, Byrd, Cook, Dew, Baker, Cooper, Early, Ivey, Oates, Paris, Jump, Lively, Nale, Paine, Ray, Roach, Frye, Swift, Tanner, Taylor, Gardner, Whitehead and several Hills. On the staff in one of the large main offices there are two operators; one named Penn and the other Ink. Yet the chief operator boasts that there are neither pen nor ink in his department.

Appreciated Old-Timers' Proceedings.—Hon. Wm. H. Dougal, the well-known old time and military telegrapher of New Preston, Conn., and one of the prominent citizens of that State, writes: "The printed proceedings of the Old Time Telegraphers and Historical Association and of the Society of the United States Military Telegraph Corps received. I wish to state that it is a mighty slick publication. It is simply a 'jim dandy.' Even the Gospels are not gotten up in better taste."

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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THE UNIVERSAL SELECTOR
FOR TELEGRAPH AND TELEPHONE

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THE use of Kerite is the logical result of experience.

The widespread use of Kerite is the logical result of a widespread determination to use nothing but the best in signal service.

DAYS KERITE

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO

THE RAILROAD.

TELEPHONE DISPATCHING IN HONDURAS.—The railroads on the coast of Honduras are dispatched by telephone instead of telegraph.

N.W. Jones, Superintendent of Telegraph, Philadelphia, Reading and Pottsville Telegraph Company.

Mr. N. W. Jones, who has just been appointed superintendent of telegraph of the Philadelphia, Reading and Pottsville Telegraph Company, with headquarters at Reading, Pa., is a deep-dyed Reading Railroad man, having spent his entire business career in the employ of that company. He was born in Reading, August 11, 1861, and entered the telegraph service May 10, 1876, as messenger. He soon developed into an operator and afterwards filled positions as clerk, traveling dispatcher, chief train dispatcher, trainmaster and inspector of transportation. From this latter position he was advanced to that of superintendent of telegraph. He is therefore familiar with the duties of the position and the transition from one to the other was an easy one. He succeeds C. M. Lewis, deceased.

Wireless Experiments on Grand Trunk Railway in 1902.

In connection with the elaborate tests which have been conducted by some railroads in America and the progress made in the development of wireless telegraphy in so far as communicating with running trains is concerned, it is interesting and opportune to recall that the first experiment by any road in America and probably the world, made to demonstrate the possibility of wireless communication with a fast-running train, occurred on the Grand Trunk Railway on October 13, 1902.

The experiment in question was made under the direction of Dr. E. Rutherford (now Sir Ernest) and Dr. Howard T. Barnes, then both of the MacDonald Physical Laboratory of McGill University, Montreal. Both of these gentlemen have since obtained highest honors in the scientific world.

The following account of the experiment is taken from Dr. Barnes' official report: "During the passage of the special train on the Grand Trunk Railway between Toronto and Montreal on October 13, 1902, bearing the members of the American Association of General Passenger and Ticket Agents from Chicago to Portland, it was demonstrated that communication could be maintained between a station and a fast-moving train by means of electric waves. No attempt was made to cover distances comparable in size by those attained by Marconi and others, but with comparatively simple laboratory apparatus it was possible to keep the train in touch with the station for from eight to ten miles. St. Dominique was selected as the transmitting station, where two large metal plate vibrators 10 x 12 feet connected with an induction coil of the usual pattern were situated. On the train itself the waves were received by collecting wires connected to a coherer of nickel and silver powder. The relay operated electric bells in three cars. The collecting wires were run through the guides for the train signal cord, and extended on both sides of the coherer for about one car length.

"To obtain the maximum effect it would have been better to have had a long vertical wire, but since such was impossible, the horizontal wire was used. Although these were placed inside the steel-frame cars, strong and definite signals were obtained over the distance named. Another difficulty militated against obtaining the maximum sensitiveness as, owing to the natural vibration of the train resulting from its great speed, it was impossible to have the relay adjusted to its most sensitive point.

"In spite of these difficulties, the distance to which signals could be sent to the train was eminently satisfactory, and with more refined apparatus greater distances could without doubt be obtained.

"The success of this form of wireless telegraphy, of which this was but a pioneer experiment, opens up yet another method of providing for the safety of the traveling public."

MUNICIPAL ELECTRICIANS.

MR. D. C. DONOHUE, operator in charge of the bureau of fire alarm telegraph, Borough of Richmond, New York, has made his report for the year 1916 and it is an excellent record of the efficiency of his department. Through the co-operation of the fire alarm with the fire department the fire loss was very low. Mr. Donohue's work is warmly commended by Staten Islanders. He was connected with the Manhattan Bureau for twenty years before he was appointed head of the Staten Island department, and is an old-time commercial telegrapher.

CAPT. WILLIAM BROPHY, aged seventy-eight years, a well-known consulting engineer, of Boston, and formerly city electrician of Worcester, Mass., died in Jamaica Plain, Mass., January 24. From 1894 to 1900 he was chief electrician of the Boston wire department.

Addition to Phillips' Code.

It has been suggested to spell out, in future, the word "how" in the Phillips' Code and to use "hw" to signify that a hard word is to follow. This prefix may be employed before those words that are usually gone over a second time and before words that start with spaced letters, such as Irish, eccentric, reiced, irradium, and words of that class. It is believed that the prefix "hw" would be a great source of solace when used, as a sort of headlight warning when the name of some of the Russian, Turkish and other foreign words with jaw-breaking spelling are to follow.

How to Obtain Patents.

If you have an idea that you think is patentable in a concrete form the patent department of TELEGRAPH AND TELEPHONE AGE is at your service to advise and direct you. This department is in charge of Mr. W. B. Vansize, who has had a wide and extensive experience as an attorney-at-law and a solicitor of patents. All business will be given careful attention and treated with the utmost confidence.

The Christian Religion and the Morse Telegraph.

BY WALTER P. PHILLIPS.

(Concluded from page 59, February 1)

[NOTE—This article was started in the January 16 issue and continued in the February 1 number. The concluding portion follows.]

The story that Mark Twain came to pecuniary grief through the bad management of the publishing business in which he was interested with his relative, C. L. Webster, father of the late Jean Webster, author of "Daddy Longlegs," is without foundation in fact. It was his devotion to the Page machine, coupled with the purely human tendency to throw good money after bad, that brought his proud head to the dust. Another bit of fiction that is printed every now and then is that, staggering under a great burden of debt, Mr. Clemens girded on his armour and started around the world—following the equator, as he termed it—lecturing to such intellectual giants, in some parts of it, as have a sense of humor that is absolutely overwhelming. Some of them could read and write, but ofttimes resorted to the sign language. These entrancing dwellers in safe and genial environments gladly surrendered their money to hear Mr. Clemens talk and were proud of the opportunity to do so. When, so the story goes, he appeared and forced American humor down the throats of these highly intelligent and appreciative persons, money like a veritable flood light, rapidly filled the lecturer's gaping coffers and thus he was enabled to pay his debts. The truth is he started on a lecturing tour and was fairly successful, in some places, until he fell ill. When it became known that he had succumbed to the strain of travel, one night stands with sometimes a run of bad business, and that he had not exactly been electrified by personal contact with the people who dwell in the vicinty of the equator, his unfailing friend, Henry H. Rogers, cabled Mark's London bankers to find him and tell him to come home, adding: "I will pay his debts." That being a most agreeable proposition from Mr. Clemens' point of view, he accepted Mr. Rogers' offer and resuming the work for which he was grandly fitted be accumulated another fortune and no doubt settled with Mr. Rogers, in due course, in a manner that was entirely satisfactory to the ex-baggage master from the Old Colony Railroad and later an oil magnate who, in spite of the assaults of Thomas W. Lawson in his "Frenzied Finance," was regarded as an all-around good fellow to the day of his sudden and deeply lamented death.

As a lecturer, Mark Twain was rather tiresome, owing to his slow manner of speech. He once told me, with his characteristic drawl, that he hated the lecture platform and added, with perfect gravity: "They make me talk so fast to try and keep people from leaving the hall, that it becomes an awful bore."

In Francis Wilson's song about the ostrich he sings: "I'll stick my head in the sand he said." Then he goes on to relate how the ostrich was too confident that he could not be discovered, and further that he can now be seen—stuffed—in the window of a downtown taxidermist. The expensive fiasco of Page, carrying ruin to many, is also stuffed and can be seen in the museum of the Mergenthaler Linotype Company by which it was purchased, as one of the curiosities in the line of mechanical monstrosities. Maybe the multiplex will escape the fate of the ostrich and the Page typesetting machine; but behind it looms, always, the simple, economical, convenient, and all-conquering Morse system. The question arises in my mind, and I imagine in the minds of many other men who think, "Can you beat it?" Morse telegraphy calls for the introduction of mentality. In my judgment this is a necessary factor in the problem of correct work. Those who hold that the human element can be eliminated and the end in view accomplished, automatically, by automatons, seem to me to be open to the criticism that applies to the atheists who maintain that the world and all the celestial phenomana that so puzzle the finite mind come by chance, and that God is a myth. My own thought is that God is the one great reality, and that the best expression of our resemblance to our Maker is shown in that we posses intellect and have the power to think and reach logical conclusions. I know of no place in all this busy world, where gray matter is more seriously needed than in the correct transmission and transcription of telegraphic messages. Errors may not only wreck fortunes, but they may break human hearts. The effort to do without men and women of intelligence and varied experience is not the part of wisdom from my point of view. What would have become of the telegraph and the telephone but for men like David Homer Bates, Albert B. Chandler, Charles A. Tinker, Robert C. Clowry, Theodore N. Vail, J. J. Carty, G. M. Yorke, Newcomb Carlton, John C. Willever, G. W. E. Atkins, W. N. Fashbaugh, Thomas W. Carroll, E. J. Nally, George G. Ward, E. W. Collins, Edward Reynolds, Charles P. Bruch, Minor M. Davis, Charles C. Adams and their numerous alert and zealous coadjutors? What would American railroads have been, today, but for such men as Thomas A. Scott, Alexander J. Cassatt, E. H. Harriman, William C. Van Horne, J. J. Hill and the hundreds of men of their kind who have been associated with them? Journalism in this country would be in the gloaming, as Charles Dickens found it when he came here first and wrote of Jefferson Brick, but for the presence in the profession of men like James Gordon Bennett, father and son,. Horace Greeley, Henry J. Raymond, Charles A. Dana, E. L. Godkin, Carl Schurz, Charles H. Taylor, Edward P. Mitchell, Joseph Pulitzer, Arthur Brisbane, Adolph S. Ochs, Charles R. Miller, Henry Watterson, Horace White, Henry Villard, Joseph Medill and their uncounted associates in the great work of making honest and respectable newspapers? In all the leaders among these men the Divine spirit has been, overwhelmingly in evidence in the shape of farsightedness, the habit of industry, phenomenal understanding and an almost supernatural apprehension.

Even as I write I receive a letter telling me that the multiplex has led a recent writer to say that the telegraph operator is to give way to the mechanic in the near future. As well say that no more books are to be written, all that is necessary being to have printers to do the mechanical work and the books will write themselves. Let us listen to the opinion of a sage and philosopher—a man of great intellect. Henry Ward Beecher, in his lecture entitled, "The Wastes and Burdens of Society," used to say something like this: "A man with only a pair of hands with which to serve says that he is just as good as any other man. Well, he isn't. Another man has a strong pair of hands and a better intellectual development and he is a better man than the first one. Yet another man has good hands and a big brain and he is worth dozens of both of the others. The world is ruled by intellect and all the good work is done by those whose ability is not confined to their hands and fingers. That is what God does. He stamps the mental caliber of every man upon his brow and the nature of those markings is shown by what each one of us accomplishes."

The high standard of service established during the past sixty years by Morse operators must, of course, be maintained, as the public, quick to analyze changing telegraphic conditions, will demand reduced rates for what they conceive to be an inferior service and will shout themselves hoarse for a government telegraph. The public is absolutely out of sympathy with any situation created for the purpose of paying abnormal dividends to stock holders and thus giving inflated stock an ostensible value which it does not actually possess.

The situation of the telegraph companies, unless it is a part of their programme eventually to sell themselves out to the government, a step which is favored by an apparent majority of the Morse employes, is not unlike that of the Milisian worshipper at the shrine of Bacchus, who had been told by his priest that unless he mended his ways and took better care of his family he would be turned into a rat. "Me charming bundle of rags, me own dear Ellen," the offender said with a crafty smile, "I don't believe Father Kelley could turn me into a rat, but if ye see a rat around here, kape your eye on the cat." The cat that is liable to pounce upon the telegraph, at any session of Congress, is always a menace to existing telegraphic conditions. There are many things that the people cannot understand and they appeal to their representatives for light and sometimes for action. One of the things that mystifies the people is the fact that it costs twenty-five times as much to send a ten-word telegram to Chicago as it does to send a letter to California or to any of the foreign countries that are in the postal union. Nothing stimulates curiosity as to this peculiar situation like the announcements of increased earnings through the introduction of machinery and the utilization of a class of labor that seems to be reconciled to a rate of compensation less than is received by barbers, waiters and many others whose work does not demand any general education whatsoever.

Bridgeport, Conn., January 11, 1917.

Do not act disrespectfully to a subordinate; he may be your superior some day.

"Old Farmer" Lawton Heard From Again.

Mr. George E. Lawton, better known as "Old Farmer" Lawton who, after forty years of active service for the Western Union Telegraph Company at Denver, Col., retired two years ago, since which time he has lived on his farm at Plymouth, Ill., in a letter dated December 28 has this to say:

"Am enjoying life immensely in this quiet little village. Hardened up my muscles by putting in a big garden last spring, kept the lawn cut all summer on a town lot about the size of a New England farm, and wound up this fall, by sawing enough stove wood to fill our wood-house that's about the size of a country school house. Outside of a couple of rounds with my old trouble, high blood pressure, feel about as well as a man should expect to at my age.

"You may have never noticed this place being advertised as a winter and summer resort, but it has them all beat a mile. It takes all of a man's income to buy clothes enough to keep from freezing during the winter months, then he has to dress like a cannibal during the summer. If you ever tour the West again take my advice and cross over the middle states in an aeroplane.

"Was glad to see my 'Alphabetical' friend A.B.C. of Chicago swing the first trick at Denver. He is a mighty good man, and my old associates out there write that they have already fallen in love with him and his style of doing a big business for a big company.

"You will notice by the inclosed article that the 'Old Farmer' is still able to hold his own on the firing line, but doubt very much if the allies ever get the Germans in as hot a corner as I was for a few minutes that pleasant afternoon. Run over and I will fatten you up on pure buckwheat cakes and wild bee honey."

[The article referred to by Mr. Lawton is from the local paper and gives a humorous account of the experiences of a hunting party composed of Mr. and Mrs. Lawton and some Chicago friends. After thinning out the quail, squirrel and rabbit crops, the hunters leveled a large hollow tree which contained several families of squirrels, bats and other wild things, which had taken lodgings in it for the winter. Among the other occupants was a hive of wild bees. The "Old Farmer" managed to save from the wreck a lot of fine honey, but in doing so the insects, resenting the intrusion, charged upon the enemy with the utmost vigor. The result was very painful to Mr. Lawton. —*Editor.*]

QUICK LIFE AND QUICK DEATH.—A correspondent writes regarding the death of a comrade: "He was a quick-witted fellow. He was quick to develop from the messenger ranks to a clerkship and then to an operator's position. He next developed quick consumption and we all regret his quick demise."

TRANSFERRED TELEGRAMS IN MONTANA.—A joint rate of fifty cents on telegrams transferred from the Western Union to the Continental Telegraph Company's lines and vice versa, has been ordered by the Montana Public Service Commission.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions following each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The subsequent articles will be made up in the same manner, and the series will be continuous and in logical order.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr. "Radiotelegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

PRIMARY BATTERIES.

In telegraphy, the electromotive force required for the operation of wires is furnished by motor generators and batteries.

A simple cell of battery may consist of a plate of copper and a plate of zinc placed in a suitable vessel containing a dilute solution of sulphuric acid. A number of such cells connected together is termed a battery.

Batteries such as the well-known "gravity" are generally designated "voltaic" or "primary" batteries—sometimes "chemical" batteries.

A reference here to some of the chemical terms used in connection with the subject of primary cells may assist in the subsequent descriptions.

An atom is assumed to be an indivisible particle of a substance. A molecule is a combination or union of two or more atoms. For example, water is formed of molecules, each containing one atom of oxygen and two atoms of hydrogen, represented by the symbol H_2O. An "oxide" is, generally speaking, a combination of oxygen and some metal, for example, the oxide of zinc, which is a chemical combination of oxygen and zinc. The term peroxide is used to denote those oxides containing the highest number of oxygen atoms that will combine with a given metal, as, for instance, in the case of peroxide of manganese. "Chlorides," "perchlorides," etc., are combinations of chlorine and other substances, as chloride of ammonium, commonly known as sal-ammoniac, which is a combination of four parts hydrogen, one part nitrogen, and one part chlorine. An "acid" is, generally speaking, a combination of oxygen, hydrogen, and some non-metal. For instance, sulphuric acid is a combination of oxygen, hydrogen and sulphur. Metals replace the hydrogen atoms of acids to form "salts," which are generally designated by the affix "ate," as, for instance, sulphate of copper, which is a chemical combination of sulphur, oxygen and copper; or sulphate of zinc, a combination of sulphur, oxygen and zinc.

It is known that when a metal plate is partly immersed in a liquid, for instance, dilute sulphuric acid, it becomes electrified. The extent and nature of this electrification varies in different metals, some metals being more highly electrified than others. This result is attributed to an electro-chemical difference existing between the different substances. For example, zinc is said to be electro-positive to copper; that is, its electric state is higher than that of copper. Thus when those elements are arranged as, for instance, in a "gravity" cell, the difference of potential between the plates is found to be about 1.079 volts.

The plate in such a cell which possesses the higher electric potential is termed the "positive" plate; that which is at the lower potential, the "negative" plate.

When two such plates are connected by a wire a current is assumed to flow from the positive plate to the negative plate within the cell, and from the negative to the positive outside of the cell; the terminal of the positive plate of a cell is termed the negative pole; that of the negative plate the positive pole. Thus in the "gravity" cell the positive pole is at the copper plate; the negative pole at the zinc plate.

The current will flow so long as the difference of the potential is maintained. This difference is maintained in the voltaic cell at the expense of the positive plate, which is found to be dissolved more or less rapidly, depending upon the rate at which "current" is supplied. In other words, the cell may be said to give out electrical energy at the expense of the positive plate of the cell in a manner analogous to that in which a steam engine gives out mechanical energy at the expense of the fuel in the furnace.

Certain primary cells, when "short-circuited," as when the plates are connected outside the cell by a thick wire, or when placed in a circuit of moderately low resistance, for any length of time, are known to lose their effect quickly, which is made apparent by the rapid decrease of strength of current in the circuit. For instance, if a plate of zinc be placed with a plate of copper in a cup containing a dilute solution of sulphuric acid, it will be found, as has been stated, that a current will flow when the two plates are connected by a wire, but that after a very short time the strength decreases.

Such cells are commonly termed "open" circuit cells. This term distinguishes them from such cells as the "gravity," which will maintain a current of almost uniform strength for a long period on a circuit of low resistance. Batteries or cells of the latter class are, consequently, called "constant" cells or batteries. *(To be continued)*

QUESTIONS IN TELEGRAPHY.

How is the electromotive force required for the operation of telegraph lines generated?

How is a simple cell of battery made up, and how many cells make a battery?

What are the various designations of batteries?

What is an atom and what is a molecule?

What are the elemental constituents of water, and what is the chemical formula for water?

What is an oxide and what is an acid?

Are different metals electrified to the same degree when placed in an electrolyte?

What is an electrolyte?

What is the difference of potential between the metal plates of a gravity cell?

When the elements (plates) of a cell are connected by an outside wire, in what direction does the current flow, and how long a time will it flow?

What is the effect on a cell when the plates are connected by a short, thick wire?

RADIO TELEGRAPHY.

ELECTRIC CHARGES AND STATIC FIELDS OF FORCE.

Electrical phenonema may be grouped under two general classes, those of static electricity, when the electrical charges are at rest, and dynamic or current electricity, when the charges are in motion along a conductor.

When an insulator, such as sealing wax, is rubbed with fur, or a glass tube with silk, it acquires the property of attracting light bodies near it, and is said to be charged. This action shows that forces exist in the adjacent space, and there is said to be an electrostatic, or, more briefly, a static field of force about the charged body. When two charged bodies are brought near together, they may be either attracted or repelled, depending on the nature of the two charges. If the rubbed glass or particles touched and thereby charged by it are brought near the sealing wax or particles charged by it, they will attract each other, but two bodies, both of which have been previously charged by either the glass or the wax, will repel each other. Hence, like charges repel and unlike charges attract. The names positive (glass) and negative (sealing wax) have been given, respectively, to these charges. By means of a delicately suspended insulated body we can map out the forces along directions in general perpendicular to the charged surfaces. In Fig. 1 is shown in section the static field of force between a positively charged and a negatively charged body in which the direction of the field at any point is indicated by the direction of the arrows at that point, and the intensity or strength of the field in any area is indicated by the number of lines in that area.

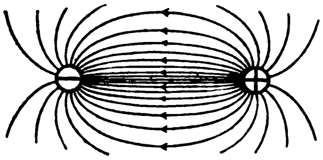
FIG. 1.

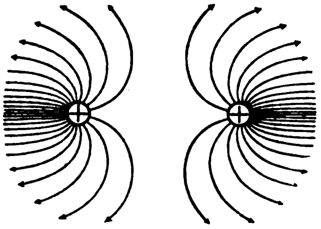
FIG. 2.

It is seen that most of the lines are crowded together between the two as though there was an actual pull along their length, thus suggesting attraction. Similarly in Fig. 2 are shown the static lines between two bodies with positive charges which are apparently driven apart, thus suggesting repulsion. If both charges were negative the direction of the arrows would have to be reversed, but the static lines would have the same shape as before. In Fig. 3 are shown in elevation the static lines from a positively charged wire near the surface of the earth. If the wire were negatively charged the signs of the charges and the direction of the arrows would have to be reversed.

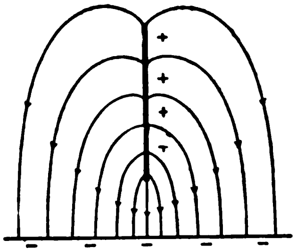
FIG. 3.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

What are the names of the two general classes into which electrical phenomena may be grouped?

What is static electricity and what is dynamic, or current, electricity?

Could static electricity be produced by the friction of conducting substances instead of insulators? If not, explain the reasons.

Does a charge of positive electricity repel or attract another charge of positive electricity?

Calculating Size of Wire.

In calculating the size of wires for a given circuit the mil-foot is used as the standard unit, which is to say, a wire of one circular mil-cross section and one foot in length; a circular mil being the square of a diameter of 1 mil or 1-1,000th inch. Although, for all conducting wires, iron, copper and aluminum, the value in ohms of the mil-foot varies, according to the specific resistance of the metal, the rule of doubling the cross section to halve the resistance or doubling the length to double the resistance, holds good universally. Thus the specific resistance of the commercial qualities of the various wires is given, as follows:

METAL	Resistance in ohms per mil-foot at zero Centigrade.
Copper	9.59
Aluminum	15.20
Iron	58.00
Steel	82.00
German Silver	125.91

In telegraph and telephone line work the sizes of wire used are usually determined by established standards. However, for special cases, where it is desirable to calculate the proper wire for a given circuit, the following simple formulae may be used to determine the unit resistance at usual temperatures: $R = r\,(CT+1)$, in which R is the required resistance; r, the given unit resistance; C the temperature co-efficient per degree, and T, the desired temperature in degrees. On the Centigrade scale the co-efficient for copper is .00388; for iron .00453; for aluminum .00390; for German silver .00044. Hence to find the unit resistance of copper wire at 75° Fahrenheit, we reduce the Centigrade scale, finding the equivalent as 23.8°, and proceed as follows to find the value of R: $R = 9.59\,(.00388 \times 23.8 + 1) = 10.475$ ohms.

Some New Telegraph Devices.

Mr. Patrick B. Delany, of South Orange, N. J., has been granted patents on three telegraph devices which have special uses.

The secret system of telegraphy is a Morse system, comprising at each end of the line an auto dot key, two polarized relays, an electro-magnetic automatic vibrator and a sounder. The automatic vibrator, which records dots on the sounder, is controlled by the polarized relay operated by the dot lever of the auto dot key. The other polarized relay, recording dashes on the sounder, is controlled by the dash lever of the key. The polarized relay armatures are biassed by retractile springs operated by reverse currents, so that a current which closes one holds the other open. This system provides simple and effective means for preventing overhearing of signals recorded by the Morse sounder in branch offices located in hotel lobbies, office buildings and other public places within hearing of outsiders who in many instances are able to read by sound and learn what is being received or transmitted over the line. In case of wire tapping, signals would be meaningless unless a complete duplicate of apparatus adjusted to the same rate of automatic vibration for dots was installed, which would be practically impossible without elaborate preparation.

The second patent covers a method of converting Morse dots and dashes as received on an ordinary sounder into vibratory signals corresponding to wireless signals as recorded in a telephone receiver. By use of this sounder wireless operators may, with a little practice, become proficient in reading regular Morse signals. The new sounder requires no change in wire connections or battery, and may be substituted for the regular sounder in a minute for permanent use.

A return signal system is the subject of the third patent. The object of this system is to provide an acknowledging signal from the distant end of a circuit to prove the operation of the receiver and the effective arrival of the signal transmitted from the sending station, so that each dot and dash sent over the line is automatically repeated back and registers itself at the sending station without interference with the signal impulse going out on the line.

The Telegraph and Telephone Life Insurance Association has levied assessment 615 to meet the claims arising from the deaths of J. P. Smith, at Sullivan, Ill.; A. A. Ferris, Brooklyn, N. Y.; W. E. King, Brooklyn, N. Y.; A. G. Ryer, San Francisco, Cal.; W. A. Miller, Philadelphia, Pa.; T. R. Brooks, Philadelphia, Pa.

Bound Volumes For 1916.—Bound volumes of Telegraph and Telephone Age for 1916 are now ready for delivery. The book contains 600 pages and is a complete record of progress during the year in telegraphy, telephony, cable telegraphy, radio-telegraphy and every other application of electricity for the transmission of intelligence. The contents are focused in a complete index and the valuable articles are thus readily available. The price per volume is $4.00 per copy, carrying charges collect.

The Barclay Printing Telegraph System.

A new edition of "The Barclay Printing Telegraph System," written by Mr. William Finn, the well-known telegraph engineer, has been published and is now obtainable. This book gives a very complete description of the Barclay system and is fully illustrated. The price of the book is only fifty cents per copy. For sale by Telegraph and Telephone Age, 253 Broadway, New York.

Continental Alphabet Records.

An operator writes us "I desire to learn the Continental code. I purchased one of the talking machine records containing the Continental alphabet and figures. I run it through a talking machine a few times and I soon became familiar with it. This is truly an excellent and simple method for Morse operators to acquire the Continental code." These Continental alphabet talking machine records can be obtained at the office of Telegraph and Telephone Age, 253 Broadway, New York, at $1.25 each.

Books that One Dollar Will Buy.

The Management of Electrical Machinery. By F. B. Crocker and S. S. Wheeler. A practical work on the subject. Illustrated.

Hughes and Baudot Telegraphs. By Arthur Crotch. This is a practical description of these two systems of telegraphy and is devoid of mathematics and technicalities.

The Telegraph Instructor. By G. M. Dodge. This volume is designed for the student and beginner. It is written in a very clear style. It has 260 pages.

Twentieth Century Manual of Railway and Commercial Telegraphy. By Fred L. Meyers. This up-to-date work covers forms of all kinds of commercial messages, train orders, phrases, etc. It has 269 pages and is illustrated.

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MR. JEFF W. HAYES' DEPARTMENT.

The Pleiades Club.

CHAPTER VII.

The Pleiades Club, of which so much has been written lately, seems to possess some value based upon the fact that it brings to the attention of the old and new-timers the names of former prominent telegraph people, those who excelled in the art of telegraphy and those who possessed qualities that made them shining marks in the eyes of their contemporaries. It is the intention of the author to cover those sections of the country where there were well-known members of the profession. Of course it must be remembered that the exceptional operators of ye olden days sooner or later gravitated to the large telegraph centers, such as New York, Chicago, Philadelphia, St. Louis, Boston, San Francisco and a dozen other cities which have housed at one time or another the brilliant operators of the past, those who have left their impress on the fraternity that will not be effaced for many generations to come. These old-timers have left their record in printers' ink. The younger-timers, as they advance in years, become the old-timers of tomorrow. Thus history repeats itself.

The eastern coterie of members of the Pleiades Club without hesitation called upon Alfred S. Downer to preside over the gathering of the New York contingent. Manager Downer, who wielded the scepter of authority in the general operating room at 195 Broadway, New York, for so many years, was now on a level with those who worked the way wires in his office. His brother, David R. Downer, who was never known to utter a stronger swear word than "My stars," was the assistant manager. He related that he had reprimanded hundreds of operators for making errors, then he himself was found guilty of putting down "Admiral Jones, Commander Nasty Yard, Brooklyn, N. Y." He admitted that to the day of his retirement from the service this "Nasty" Navy error had haunted him. The incident was remembered by the old New Yorkers present, among them being Morris Brick, James H. Largay, David B. Mitchell, Leslie Bradley, J. H. Dwight, A. S. Brown, Thomas Kennedy, Thomas Dolan, Fred. W. Baldwin and many others. This last-named gentleman had fastened to his belt many practical jokes he had "pulled off" while on earth. In fact, it was a dull day or busy one at the wires, whatever the case might be, when Fred. Baldwin failed to disturb the serenity of the otherwise calm atmosphere of the operating department with his mirth-exciting pranks.

Sometimes he was known as "Old Man Kav," and it is to the credit of the latter that he coaxed every new arrival in the office to work extra the first day or night as the case might be for "Old Man Kav" without compensation. "Old Man Kav" may have been a myth but he was an expensive one to the new arrivals. There never was so much sickness or dire distress attached to anyone compared with the excuses advanced by "Old Man Kav" to work the new comers or rather introduce them to the New York fraternity, persuading them by carefully worded notes to work for him.

The New York force was large and it necessarily had its quota of cranks. When they became generally known as such their lives were made, to say the least, unhappy at times. John Lenhart frequently found the desk at which he worked fumigated with limburger cheese, but who performed the ceremony no one could ever find out.

Every new man on the force was instructed by note signed "Old Man Kav" to hand his worn-out pens and penholders to irritable Tom Kennedy, the wire chief, but to discover who issued such instructions was more than the office detective could find out.

No married operator in the New York force thirty or forty years ago was considered first-class until he had purchased in one of the suburban New Jersey or Long Island towns a home of his own. It was not a difficult task to him to figure how six good laying hens could yield a sufficient number of eggs, the profit on which would pay for his home in five years. One of these lightning calculating operators had drummed up quite a few customers for his fresh-laid eggs. He brought them to the office each morning, hid them away until noon, when he delivered them to his customers. It did not take long, "Old Man Kav" said, for him to size up the hen merchant's tricks. He speedily made arrangements with a local egg dealer to furnish him with a few dozen eggs that had seen better days and some previous years. As the fresh eggs arrived each morning and the unsuspecting owner was busy at his wire, the old-time product was substituted for the strictly fresh variety. The reader can imagine the nature of the language that was exchanged during the following week between the embryo egg merchant and his customers, some of whom were officials of the company, more vividly than anything we can say. The office detective again failed to locate the guilty party and the egg merchant speedily went out of business.

Tom Finnigan, who barricaded the entrance to the operating department with his portly form, was a character different from anyone else that ever graced the New York telegraph ranks. His utterances were dry and crispy and served to keep the "good fellows" on the force supplied with ample material as a basis for their jokes. It was Tom's duty to announce to the manager those at the door who wished to see him. One day a Texas operator was an applicant for a position. Tom reported his arrival to Manager Downer, who asked Finnigan if the fellow looked as though he was a good, fast telegrapher. Finnigan quickly responded "I think he is. He tells me he came up from Texas on a cyclone." The manager, turning to Finnigan, said "You have my authority to hire him."

Chairman Downer was an attentive listener to all that had been said concerning his management and he nodded affirmatively as the old stories were retold.

It will be interesting to relate how the improvident telegraphers in the olden days spent their money. They were paid every Friday. With the extra work that was forced upon them they earned from $20 to $50 per week. On Friday night their suppers cost them two to three dollars; on Saturday night one and a half to two dollars and a half; on Sunday night a dollar to a dollar and a half; on Monday night from fifty cents to a dollar; on Tuesday night from twenty-five cents to fifty cents, and on Wednesday and Thursday nights, ten to fifteen cents. Frequently money had to be borrowed to pay for Thursday's meal, but as the office boys could be depended upon for a "touch" the old-timers never went hungry.

The formalities were brought to a close to give the former New Yorkers an opportunity to greet their old employer.

Personals.

Thomas Austin, well-known all over the telegraph field, but particularly in the South, is now with the Texas Postal at Dallas.

We are indebted to O. M. Screws, of the San Antonio, Tex., office, for many courtesies shown us during a recent visit to that city.

Colonel John L. May, who had his regiment at the Mexican border, has returned to Portland, Ore., and occupies his old position as assistant superintendent, Southern Pacific Railroad.

David Allen, erstwhile with the Hearst people in New York, but more recently with the Canadian Pacific Railroad, is now with the Western Union at San Francisco, Cal.

Thos. Stanley Cunningham, a telegrapher of note for many years, is manager for the Federal Telegraph Company, San Francisco. Mr. Cunningham is robust and in splendid health, which will be a matter of rejoicing among his many friends.

E. G. Folger, for many years manager for the Western Union at Oakland, Cal., is now with the American District Telegraph Company of the same city.

M. J. Walsh, who was brought up in the Chicago office and who was a familiar figure around that city for many years, is now with the Western Union at San Francisco.

Ted Nivison, who recently became a benedict, is manager for the Federal Telegraph Company, Portland, Ore., and is showing the people of that city how to use the telegraph.

Shelved.

The way was long, the wind was cold,
The operator was infirm and old;
His withered cheek and tresses gray
Seemed to have known a better day.
The last of all that band was he
Who worked the Overland in '73.

Normandy was the name of a handsome coal black, intelligent horse attached to engine house No. 10. We became great friends and every day I would bring him some pieces of sugar or an apple.

These attentions became part of Normandy's life and he would make a big demonstration when he saw me coming down the street. I would pat him and smooth down his beautiful black coat and the horse gave every evidence of appreciation. An unlucky day came for me, and I never again saw my beautiful friend, but never lost track of him.

Years passed by and the City Council, believing that Normandy had earned a long rest, gave him away to a kind-hearted groceryman, who promised to treat him well. One day Normandy was being exercised, when the fire bells began ringing and down came engine No. 10 with one of Normandy's former colleagues in harness.

Forgetful of good manners and all propriety, the pensioned horse started off with his former companions, neck and neck, despite the efforts of the good groceryman. It needed the intervention of a policeman to separate Normandy from the engine and he was taken to his stable, where he died the same night. Some said it was heart disease, but it was more likely a broken heart.

We find similar cases among the pensioned employes of the telegraph companies. Many persons who have arrived at three-score and ten are capable of giving as good service as in former years and they object to being automatically pensioned. Many who have been careless and laid up nothing, worry and are grief-stricken, believing the world has nothing further in store for them, court death, and generally get what they look for.

An operator, drilled in his peculiar labor all his life, is timid about taking up something else. He has been but a part of a machine, never had to do much thinking outside of copying correctly the messages sent him, and the initiative is a new thing for him.

There have been cases where an operator was retired one day and died the next, or in a few weeks from the date he was shelved. This may be but a coincidence, but such cases are not rare, and really should not be at all.

There should be a field of labor for the old employe who is still able to do good service and who is willing to work.

Too many broken hearts are occasioned by forced retirements, both from the commercial as well as the railroad services.

Dallas, Tex., Western Union Notes.

Dallas is one of the busiest and most progressive cities and telegraph centres in the southwest, indeed, in the country, and its telegraphic equipment is up-to-date in all respects. The entire staff has the youthful spirit and keeps things humming.

L. A. Ott is manager, D. C. Cason, assistant manager; E. H. Patton, city commercial agent; E. E. Shirley, cashier, and there are twenty-four employes in the various clerical positions.

Traffic department—Morse: W. S. Strawbridge, chief operator; W. A. Logan, night chief operator; G. E. Mansenarius, assistant chief operator; A. G. Daniels, A. L. Roos, A. X. Muller, M. C. Hill, J. G. Jones, Jack Gunther, J. A. Carlton, R. B. Goodson and G. E. Wilkinson, supervisors; and 129 operators.

Multiplex: R. E. Haney, supervisor-in-charge; E. A. Hester, night supervisor, and eighty operators.

Plant Department: H. L. Brown, wire chief; W. E. Webb, assistant wire chief; F. R. O'Connor, night wire chief; E. A. Wood, late night wire chief; G. E. Longshie, automatic chief; H. S. Smith, late night chief, and fourteen repeater chiefs, besides twelve automatic attendants.

Telephone Department: Mrs. G. N. Williams, supervisor; Miss Ruby Smith, night supervisor, and fifteen operators. There are also fifty employes in the traffic clerical department.

The members of the Western Union "Accuracy First" League held a year-end luncheon at the Oriental Hotel, Dallas, December 29 last. The luncheon of eight courses was followed by instructive talks by W. A. Logan, night chief operator; E. H. Patton, commercial agent; Jack Landon, claim agent, and E. A. Hester, night supervisor, after which a diamond emblem was presented to Mr. Hester, the organizer of the society. The purpose of this society is to increase the efficiency of the employes, thereby rendering the company and public a greater service.

Members present were W. A. Logan, toastmaster; E. H. Patton, J. Landon, E. A. Hester, W. V. Dublin, R. A. Williams, Roy F. Cooper, J. E. Mercer, George McCormick, Sholto Rasmussen, M. H. Bingham, Paul Bowling, Dempsey Berryhill, Simon P. Oster, J. L. Barnes, W. R. Huffhines, J. Merle Garrett, C. C. Wheeler, Cyril Rhodes, Henry Evans, W. S. Lomas, H. W. Alston, W. R. Goza, L. C. Prewitt, Raymond Smith, Watt W. Winn, V. D. Ingram and F. T. Poe.

LETTERS FROM OUR AGENTS.

New York Western Union.

H. M. Heffner, assistant chief operator in charge of the Commercial News Department, returned February 1 from an extensive business trip.

O. McCullen, wire chief of the Washington, D. C., office, was a recent visitor at headquarters.

A class has been formed for multiplex instruction of members of the general office and division office staffs. R. F. Drehner is the instructor. Mr. Drehner has prepared a large number of slides covering the drawings of the various specifications and by the use of a stereopticon makes his lectures on this subject very interesting.

J. P. Clolery, supervisor of the Jersey Division, has been appointed agent in this office for the Telegraph and Telephone Life Insurance Association. Mr. Clolery is well-known to the fraternity, having been identified with this office for about thirty-five years.

John P. Cahill, connected with the service department, died January 30. He had been in the employ of this company about thirty years.

W. B. Richardson, formerly and for many years an operator in this office, died in Boston January 20.

Terry Conaty, an old-time operator, formerly of this office, but for the past few years in the employ of the government, died January 25.

Stanley Gross, aged thirty years, board and plant attendant in this office, and who during the past season was in charge of the telegraph office at Shadow Lawn, N. J., the summer home of President Wilson, died of Bright's disease January 25. The remains were removed to Bloomsburg, Pa., his home town, for burial. He was a well-known and well-liked young man and of exceptional ability. His loss will be keenly felt by all who were honored by his friendship. The deceased was a member of Amity Lodge, F. and A. M., New York City. Masonic services were conducted by the Bloomsburg local lodge of that order. Mr. Gross is survived by a wife, mother, father and one brother.

The offices at 407 Broadway and 444 Broome Street have been consolidated at 428 Broadway, corner of Howard. The office at 26 West Thirty-first Street has been moved to No. 12, the same street.

Boston Western Union.

Vacations are under way for the year 1917. Every two weeks a fresh detail of a dozen or so wend their joysome way to the cashier's office with two or more vouchers labeled "vacation." Among those who have recently returned to their duties after having snow-shoed through Maine and other states, and showing evidence that they thoroughly enjoyed the glorious New England winter, are traffic supervisor Earl W. Mace and repeater attendant William T. Budds. They report the snow along the Androscoggin River averages about four feet and say there will be a generous ice-harvest in Maine.

On February 1 the regular meeting of the Western Union Educational Society was held in the ladies' rest room at the main office. There was a large attendance. Following the business meeting refreshments were served, after which the devotees

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of Terpsichore revelled in their favorite amusement until 11 p. m.

In the triangular bowling club contest between the plant, commercial and traffic departments, that has been under way for two months, the telegraphers have already won the "booby" prize, their percentage being something like .000½ according to the latest revised figures. Our boys are happy, nevertheless, said prize being "eats"—a dinner to the losing club, which may be given at the Woolworth Restaurant de Luxe, 490 Washington Street, opposite the Adams House.

After a lingering illness, the wife of traffic supervisor G. H. Batho passed into the beyond on the night of February 3. Possessed of a beautiful and lovable disposition, her loss is deeply deplored by a host of mourning friends. Mr. Batho has the sympathy of the entire force.

Because of the proximity of real war business is growing by leaps and bounds and the traffic department is settling down to real, hard labor. Some of the force are seriously considering a quick removal into the mountain fastnesses of Vermont should a hostile fleet appear suddenly off Boston harbor.

Washington, D. C., Western Union.

Another very successful entertainment and dance was given by the Washington Educational Society on February 2. Mr. S. B. Haig, division traffic superintendent, New York, made an interesting address. It was the Society's first opportunity to hear Mr. F. T. Albert of New York, secretary of the Employes Benefit Fund Committee. He spoke of the good work the company is doing along these lines. The entertainment was a booster affair and was given with a view to increasing the membership. The musical programme was selected from talent in the traffic department. Mr. H. F. Taff, manager of the Washington office, made an excellent address. Mr. Edward Kidwell presided and he deserves much credit for the success of the meeting. Mr. Oscar McCullen, wire chief, was master of ceremonies. At the conclusion of the entertainment refreshments were served and the remainder of the evening given over to dancing. Thirty new members joined the society and there is now a total of about 100. Fourteen of the members compose the Educational Society Band, and they will soon give a concert.

Detroit Western Union.

T. M. Haston, assistant chief operator in charge of the multiplex department, has been transferred to the office of the division traffic superintendent at Chicago. On his departure he was presented with a traveling bag by the employes.

F. H. Smith has been appointed assistant chief operator of this office, to succeed Mr. Haston.

Toledo Western Union.

The Testing and Regulating Department at Toledo, Ohio, has organized a Western Union Educational class, and will hold meetings twice each month, for the purpose of studying and discussing all subjects in connection with its work.

Philadelphia Postal.

Philadelphia chiefs have adopted a simple way of reducing the high cost of reading, by exchanging magazines. Each chief buys a periodical and after reading it will pass it on to the next man. In this way he has an opportunity of reading a half dozen or so magazines at the price of one and having the one purchased returned after going the rounds.

Miss Lillian Murray has been appointed manager of the branch office at 922 South Broad Street.

C. H. Krewson, printer attendant, has been doing jury duty in the Oyer and Terminer court.

Among the recent visitors were division electrical engineers H. C. Shaw of Chicago and J. P. O'Donohue of New York.

Chicago Western Union.

F. B. Travis, former district commercial manager, has been appointed commercial agent of the first district, and is succeeded by Herman Schroeder as district commercial manager.

D. R. Godkin has been appointed district commercial manager, with headquarters in this city.

I. I. Simon, night manager at Minneapolis, Minn., gave some of his blood to save the life of an iron worker. He was laid up for two days, but was none the worse for his unusual experience.

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NEW YORK, MARCH 1, 1917.

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High-Speed Telegraphy in England.

The committee appointed by the British postmaster-general at the end of 1913 to examine the various systems of high-speed telegraphy has just issued its report. The main conclusions arrived at are: That systems on the multiplex principle are definitely superior to the automatic high-speed systems on the large majority of main circuits for ordinary inland commercial telegraph work; the extension of systematic Wheatstone working should be discontinued; the American multiplex system having yielded the best results, seven or eight quadruple duplex installations should be ordered; the five-unit alphabet as a code for printing telegraphy is better than the Morse code, leaving out of account news traffic and submarine cable communications.

It is rather pathetic to note that the time-honored Wheatstone system has received its death sentence in the land of its birth, and that an American system has been recommended to supersede it, but that is one of the things to be expected in telegraphic progress.

The Mackay Report.

The annual report of President Clarence H. Mackay, of the Mackay Companies, is full of optimism and is a highly interesting document. Mr. Mackay is very conservative in his statements, but notwithstanding that there is a strong undercurrent of good cheer to the stockholders, and the most satisfactory news is that the earnings of the companies warrant an increase of dividends on the common stock from five to six per cent. The business of the companies evidently is in a very satisfactory condition or such a move would not be proposed.

The long distance telephone service now being conducted by the Postal Telegraph-Cable Company, while it is considered a by-product, works advantageously to the company in two ways, viz: it brings in fresh income and helps telegraph business. It is interesting to note how well this enterprise has turned out.

A favorable report is made of the companies' cable property, which is kept up to date in condition and operation. The enormous increase in cost of materials and labor in the operation of the cable systems have been taken care of by the increase in traffic income. Mr. Mackay has no fear of the effect of wireless on the future prosperity of the cable business.

Altogether this report is one of the most satisfactory ever issued by the company and it cannot fail to meet the hearty approbation of the stockholders.

Location of Main Operating Rooms.

In a communication printed in another column a Texas correspondent advocates locating main operating rooms of telegraph companies in suburban districts. He believes that a telegraph company might buy enough land in connection therewith and rent out a half-acre or more to its employes on which they could build homes and engage in truck farming, chicken raising, etc., during their leisure hours.

The idea of locating operating buildings in places distant from business centers, where rents and costs are comparatively low, is not a new one, but the plan of providing chicken farms and vegetable gardens for the employes is novel. Those employes who would favor such a scheme are few and far between. Telegraphers are the most independent people in the world. They do not want chicken farms or any other kind of farms provided for them. If they want these luxuries they are willing to provide them themselves. Middle-aged and elderly employes who have reached the point in their lives where they would be content to settle down in such a community might favor the idea, but the younger ones who usually are in the majority, would in all probability entertain different views.

Attempts to establish community houses in this country have signally failed for the reason that, in principle, a man is asked to do something that he would do differently if left to follow his own inclinations, and he objects to being "classified."

In Germany, after years of experience, they have learned that it is better to scatter the employes than to concentrate them, in their domestic relations, and if this fact has been learned in a country where paternalism is a characteristic feature in life, it certainly could not take root in a country where independence is the ruling spirit.

There are some exceptions to this general scheme. Take cable stations, for instance. They are frequently located in lonely, out of the way places, and the employes are concentrated in a closely united community because no other course would be feasible; this is a necessity and there is no alternative. But it is safe to say that the average man, whether a telegrapher or not, desires the privilege of choosing his own habitation, when he can.

Telegraph and Telephone Patents.

ISSUED JANUARY 30.

1,213,837. Signal Device for Telephone Systems. To A. E. Case, Chicago.

1,214,022. Apparatus for Wireless Telegraphy. and the Like. To P. E. Edelman, Minneapolis, Minn.

1,214,258. Telephone System for Toll Traffic. To C. R. H. Arntzenius, Hague, Netherlands.

1,214,265. Detector for Wireless Systems. To M. Berel and L. Funke, New York.

1,214,283. Wireless Telegraphy. To Lee de Forest, Palo Alto, Cal.

1,214,459. Protector for Telephone-Mouthpieces. To Mary G. Heberly, Springville, N. Y.

1,214,466. Register for Telephone Calls. To E. T. Hull, New York.

1,214,492. Telephone System. To A. H. Dyson, Chicago, Ill.

ISSUED FEBRUARY 6.

1,214,511 and 1,214,512. Telephone Switching System. To H. P. Clausen, Mount Vernon, N. Y.

1,214,591. Antenna for Radiotelegraph Station. To G. Reuthe, Sayville, N. Y.

1,214,610. Telephone Receiver. To Naho Tannaka, New York.

1,214,638. Selective Lockout Telephone System. To F. W. Adsit, St. Paul, Minn.

1,214,655. Wireless Telephone Apparatus. To Burr V. Deitz, Slingerlands, N. J.

1,214,694. Telephone System. To Albion D. T. Libby, Elyria, Ohio.

1,214,969. Measured Service Telephone System. To S. S. Stolp, Chicago, Ill.

1,214,982. Automatic Telephone System. To C. S. Winston, Chicago, Ill.

1,214,989. Automatic Telegraphic or Radiotelegraphic Transmitter. To Edouard Belin, Paris, France.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on February 24:

American Tel. and Tel. Co.	125½
Mackay Companies	88
Mackay Companies, pfd.	67
Marconi Wireless Tel. Co. of Am. (Par value 5.00)	2⅝
Western Union	93⅞

PERSONAL.

MR. RICHARD O'BRIEN, the well-known old-time telegrapher and vice-president of the Society of the United States Military Telegraph Corps, Scranton, Pa., was elected a director of the International Textbook Company at its annual meeting in Scranton, Pa., February 19. It would be difficult to find a man better equipped for the position, as he has been in the upbuilding of those extensive and successful institutions, the Bell Telephone and the Western Union Telegraph companies. He is one of the public-spirited men who gave financial aid to keep the International Correspondence Schools in Scranton when in 1915 the Board of Trade and the Scranton bankers came so nobly to its assistance. He has proved his faith in the possibilities of the International Correspondence Schools and in the ability of President Weeks and his board of directors to realize those possibilities at no very distant date. Mr. O'Brien's many colleagues and friends throughout the whole country will be glad to know that he is as vigorous and magnetic as in the early days of the telegraph and telephone development; even when in another time of national peril like this, with Andrew Carnegie and other patriotic comrades he rushed to the aid of the government under President Lincoln, and led the boys of the military telegraph in the field and front throughout the civil war.

PROF. M. I. PUPIN.—At a meeting of graduates of Columbia University in New York at Delmonico's on the evening of February 19, Prof. M. I. Pupin of that University, and well-known for his work in telephony and radio telegraphy, stated that he thought he had entirely done away with the difficulties of static interference in radio work. His invention for doing this, he said, had been given to the army and navy. He paid a compliment to the American Telephone and Telegraph Company by stating that it is one of the two greatest organizations in the world, the other being the British navy.

MR. F. R. W. CLEVERDON, of the Engineering Corps, Department of Docks and Ferries, New York, has become a member of the corporation of Allen N. Spooner and Son, Inc., New York. Mr. Cleverdon is the son of Mr. John F. Cleverdon, of the engineering department, Postal Telegraph-Cable Company.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. Edward Reynolds, vice-president and general manager, made a business trip of inspection through New England recently, during which time he attended the annual meeting of the Mackay Companies in Boston, on February 15. He visited Bridgeport, Hartford and New Haven, Conn., and Springfield and Worcester, Mass., besides Boston. Mr. Reynolds was accompanied through Connecticut by Superintendent C. F. Leonard.

Mr. J. G. Blake, general superintendent, San Francisco, Cal., is inspecting offices in New Mexico. He will also visit the El Paso, Tex., office.

Mr. H. E. Patton has been appointed manager at Cleveland, Ohio, vice Mr. A. L. Lafferty, resigned. Mr. Patton was formerly manager at Des Moines, Ia.

Mr. E. A. Newman, formerly chief clerk to Superintendent C. A. Comstock, at Chicago, has been appointed manager at Des Moines, vice Mr. H. E. Patton, transferred to Cleveland.

Samuel D. Spriggs, aged sixty-four, night manager of the Baltimore, Md., office of this company, died February 22. Mr. Spriggs had held many important positions in the service and was highly regarded by the officials of the company.

John Costelloe, aged sixty-one years, manager of the Cotton Exchange branch office of this company, died at his home in Brooklyn, of pneumonia, on February 25. He was born in Ireland in 1856 and entered the telegraph service as operator on the Central Ireland Railroad in 1867. He came to America in 1875, and served in the United States Navy from 1877 to 1881, when he went with the French Cable Company, and later with the Western Union. He was with the Postal Telegraph-Cable Company for thirty-three years. He is survived by his wife, one son and two daughters. Deceased was very popular and was a member of the various telegraph fraternal and social organizations.

Signal Corps Reserve of Prominent Telegraph and Telephone Officials.

A signal corps reserve, composed of prominent telegraph and telephone officials, is being formed to co-operate with the government in taking care of the problem of communication in the event of war. Following are the members of the corps: J. J. Carty, chief engineer, American Telephone and Telegraph Company; George M. Yorke, vice-president in charge of plant and engineering, Western Union Telegraph Company; F. B. Jewett, chief engineer, Western Electric Company; Charles P. Bruch, vice-president, Postal Telegraph-Cable Company, and F. A. Stevenson, general superintendent of plant, American Telephone and Telegraph Company, all of New York.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Mr. Lewis Dresdner, treasurer of this company, New York, has returned to his office after a two weeks' pleasure trip to New Orleans. He was present at the Mardi Gras festival in New Orleans, and visited relations in that city and vicinity. He was accompanied by Mrs. Dresdner.

Mr. C. H. Gaunt, general manager, Chicago, accompanied by Mr. C. J. Eldridge, division cable manager, were recent Cincinnati business visitors.

Dinner of the Morse Electric Club.

The dinner of the Morse Electric Club, New York, was held at the Hotel McAlpin on the evening of February 15, and was a very enjoyable affair. The attendance was somewhat smaller than usual but that was probably due to the inclement weather.

There was some disappointment at the absence of Mr. Newcomb Carlton, president of the Western Union Telegraph Company, who was expected to be present, but the company was well represented in the heads of several of the executive departments.

The after-dinner entertainment included excellent singing by W. A. Wallace, Nathaniel Giffin, and novelties on the piano by W. C. Merly, all members of the club.

This was the first meeting presided over by the new president of the club, Mr. G. W. E. Atkins. Mr. Atkins received the hearty congratulations of those present on his election to the presidency, and he will no doubt make an active president and keep the affairs of the club up to the high standard attained. He is vice-president of the Western Union Company and one of the best known and oldest officials in the service.

Following is a list of those present:

Baltimore—E. W. Day, C. Selden.

Brooklyn—C. A. Harvey, T. R. Harvey, H. E. Hayden, M. J. Hayden.

New York—G. W. E. Atkins, G. C. Atkins, H. D. Austin, W. J. Austin; C. A. Bauer, J. R. Beard, J. W. Behre, G. R. Benjamin, J. A. Berry, J. J. Boelsen, L. C. Boochever, T. M. Brennan, M. J. Brooks, J. Y. Byers, G. R. Calvert, J. S. Calvert, J. T. Carberry, A. Carlson, P. J. Casey, J. W. Casper, J. W. Connolly, J. W. Connolly, Jr., J. M. Creamer, C. W. Crouse, S. R. Crowder, C. J. DeLacy, J. F. Donovan, H. W. Drake, J. W. Drake, R. F. Drehner, M. Dresdner, A. J. Driver; Edw. Everett; W. N. Fashbaugh, J. D. Felsenheld, T. F. Flynn, W. S. Fowler, D. Fuchs; N. Giffin, Dan'l Gilvey, P. E. Grogan; S. B. Haig, H. M. Heffner, F. W. Heller, W. G. Higgins, J. R. Hyland; Gardner Irving; Charles Jacobson; P. Kinman, F. Kitton, Alex. Kline; W. A. McAllister, C. B. McCann, J. F. McGuire, L. McKisick, A. A. McNeill, W. H. Mathews, J. Maxwell, W. C. Merly, G. H. Messner, A. L. Miller, C. Mills, C. H. Murphy, R. F. Murphy, R. J. Murphy; Albert Nachmann, J. F. Nathan; G. E. Palmer, J. M. Phelan, J. Piccolo, E. D. Pitt, J. D. Price, T. D. Price, M. E. Pierce; C. E. Rafford, J. W. Reed, B. H. Reynolds, George Roehm, Lester Roth, Theo. Royen; F. J. Scherrer, W. A. Schudt, A. Simon, T. G. Singleton, Daniel Skelton; T. R. Taltavall, J. Tausek, J. P. Tompkins; H. F. Van Every; W. A. Wallace, A. O. Wallis, W. P. Waters, J. C. Willever, J. M. Wintress; G. M. Yorke.

Louisville, Ky.—Charles Smith.

Philadelphia—R. A. Black, J. W. Collins, W. M. Phillips.

Pittsburg—W. J. Dodge.

THE CABLE.

Mr. George G. Ward, vice-president and general manager of the Commercial Cable Company, New York, has returned from Atlantic City, N. J., where he has been recuperating after an attack of influenza. He is feeling better and is at his desk again.

Messrs. J. J. Welch, assistant cable traffic manager in America, Western Union Telegraph Company, and T. F. Foley, superintendent of the Hammels, L. I., cable station, are on a business trip to Sydney, Canso and Halifax, N. S.

Mr. John B. Hemming, formerly superintendent of the Commercial Cable Company's Canso, N. S., station, has been appointed superintendent at Havana, Cuba.

Censorship on Pacific Cable Business.—Messages for wireless transmission beyond Honolulu to places in Hawaiian territory or the South Sea Islands must not give the name of a vessel and the date of arrival or sailing in the same message.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to February 24, 1917, as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable), October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917; Guam and Manila, February 21, 1917.

CANADIAN NOTES.

Mr. Frank E. Camp, formerly inspector, Canadian Pacific Railway Company's Telegraphs, at Brandon, Man., and a son of Mr. Wm. J. Camp, assistant manager of telegraphs of the same system, is at the present time at the Canadian Engineers Training Depot in England. Mr. Camp went to England last summer with his company of engineers for overseas service.

GRAND TRUNK PACIFIC.

A two days' conference of city managers of the Grand Trunk Pacific Telegraph Company was concluded at Edmonton, Alta., February 13 at the Macdonald Hotel. Many matters pertaining to increasing efficiency of the service were discussed by those present. On Monday night those attending were the guests of Superintendent W. J. Rooney at the Pantages Theatre and on Tuesday night the guests of H. Hulatt, manager of telegraphs, Montreal, at a dinner in the Macdonald Hotel. Those attending the conference were: H. Hulatt, manager of telegraphs, Montreal; W. J. Rooney, division superintendent of telegraphs, Edmonton; F. T. Caldwell, division superintendent of telegraphs, Winnipeg; S. Hutchinson, circuit manager, Winnipeg; S. Robertson, electrical engineer, Edmonton; E. H. Hiscock, electrical engineer, Winnipeg; City Managers R. M. MacMillan, at Edmonton; R. M. Hicks, Winnipeg; Geo. Jackson, Regina; J. E. Grace, Saskatoon; Geo. Moore, Calgary; G. B. Brien, Prince Rupert; J. E. Lalonde, Prince George; chief operator C. A. Radford, Edmonton, and J. O. Pilon, accountant, Edmonton. N. B. Walton, superintendent, operating department, Grand Trunk Pacific Railway, and L. V. Druce, division freight agent, were also guests and addressed the meeting.

Mr. R. Maclennan, of the Canadian Northern Company at Ste. Anne, Man., Can., writes: "Enclosed I hand you $2.00 for renewal of my subscription. I like your paper and have found out where some of my old friends are and I am glad to know that many of them are hitting the high spots."

THE TELEPHONE.

Mr. H. J. Pettengill, president of the Southwestern Telegraph and Telephone Company, St. Louis, Mo., was a New York business visitor last week. He was accompanied by Mrs. Pettengill and Mr. and Mrs. Lord of Chicago. Mrs. Lord is the daughter of Mr. Pettengill.

Mr. W. T. Gentry, president of the Southern Bell Telephone and Telegraph Company, Atlanta, Ga., was a New York business visitor last week.

Major C. W. Mackenzie, of the American Telephone and Telegraph Company, Buffalo, N. Y., gave a talk before the Young People's Society of Knox Church, Brideburg, Ont., February 5, taking as his subject his European trip He expects to deliver another lecture, the subject being his trip to California on the Telephone Pioneers' Special made in September, 1915.

Meeting of Texas Southwestern Company.—The annual meeting of the Southwestern Telegraph and Telephone Company operating in the State of Texas was held in New York, February 20. Mr. H. J. Pettengill of St. Louis, president of the company, was present.

New York Telephone Report for 1916.—The New York Telephone Company reports a gross revenue of $57,005,565 in 1916, a gain of $7,376,019 over the preceding year. The net income amounted to $15,002,260, against $11,250,700, to which was added $5,014,168 derived from investments and $590,826 miscellaneous earnings. After dividends were paid a balance of $7,265,341 remained, a total $3,463,000 larger than in 1915.

The Chesapeake and Potomac Telephone Company of West Virginia has been organized to serve the telephone needs of the entire state of West Virginia, and on the first of the year it acquired all of the property of the Consolidated Telephone Company, The Central District Telephone Company and the Chesapeake and Potomac Telephone Company. The headquarters of the new company are at Baltimore, Md.

Telegrams by Telephone in Nebraska.—A bill has been introduced in the Nebraska Senate requiring telegraph companies to use closed booths when transmitting messages between stations by telephone.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. J. de Jara Almonte, of the English Marconi Company, is now in Costa Rica on business connected with the service.

Mr. C. H. Taylor, chief engineer of the Transoceanic division, who has been in England for several months in the interests of the American Marconi Company will return to New York on the first available ship.

Mr. E. J. Simon, a radio engineer of New York, on February 14 sent a radio message from an airplane over a distance of 112 miles to the receiving station at the Army Aviation School in San Diego, Cal. Mr. Simon is collaborating with Captain Clarence C. Culver in the development of radio telegraphy as applied to airplanes.

Private Radio Messages Refused.—The naval officer in charge of the wireless station at Sayville, L. I., advises telegraph companies that the acceptance of private messages which refer to private affairs should be refused, and only commercial messages, that is, messages the text of which refers to business matters, and press dispatches, be accepted.

Hearing in Tuckerton Radio Suit.—Vice-Chancellor Stevens of New Jersey has fixed September 12 as the date for final hearing in the suit brought by the Compagnie Universelle de Telegraphie et de Telephonie san fils to compel specific performance of a contract for the conveyance to it of the radio station at Tuckerton, N. J., built by the Hoch-Frequenz Aktiengesellschaft fur Drahtlose Telegraphie.

MUNICIPAL ELECTRICIANS.

National Fire Protection Association.—The twenty-first annual meeting of the National Fire Protection Association will be held at 123 William Street, New York, March 28 and 29. Mr. Ralph Sweetland, 141 Milk Street, Boston, is the secretary.

Fire Chief Houston, of Cincinnati, Ohio, has arranged to install a telegraph system in all the engine houses which will signal the return of all the companies to their quarters from fires, besides giving other general information, without using the telephones.

OBITUARY.

E. McKee, a well-known broker operator in Atlantic City, N. J., and Philadelphia, died in the latter city January 23.

Norman A. Munz, aged fifty-four years, for the last ten years manager of the telegraph department of the *New York American*, New York, died February 14 in the Flower Hospital, as a result of a nervous breakdown.

Samuel L. Gilson, aged seventy-six years, a well-known western Pennsylvania telegrapher, died in Sewickley, Pa., February 21. He was manager of the Pittsburgh office of the Western Union Telegraph Company from 1870 to 1881 and was retired from active service three years ago.

J. J. Burleigh, aged sixty-three years, vice-president of the Public Service Corporation of New Jersey, died at his home in Merchantville, N. J., February 18. He was a telegraph operator in his early career and became trainmaster on the West Jersey Railroad of the Pennsylvania system. Mr. Burleigh built the first telephone and electric street railway lines in New Jersey and was well-known in Philadelphia and vicinity.

E. Abrams, an old time telegrapher, died of pneumonia in Buffalo February 15. He was prominent in telegraph circles in the early seventies and was all-night chief operator of the Buffalo Western Union office in 1872. He engaged in other business tor many years, meeting with success until a short time ago when he met reverses which compelled his return to the service as commercial solicitor for the Western Union Telegraph Company.

Edwin James Searls, aged sixty-seven years, a telegraph pioneer of the middle west and for thirty-seven years agent for the Chicago, Milwaukee and St. Paul Railway at Akron, Iowa, died at that place January 18. He was at one time employed by the Western Union Telegraph Company at Sioux City, Iowa, and later superintended the building of the government telegraph line into the Crow Creek agency. He was afterward private secretary to General Custer.

Handbook for Telegraph, Telephone and Electrical Engineers

"The Electrical Engineer's Handbook" is a very valuable work for telegraph and telephone engineers to have handy for reference. It is a standard work and universally recognized as accurate and authoritative and is a great help to practicing electrical engineers. It has 414 pages, many illustrations, and measures 3¾ x 5 inches. The book is a veritable mine of information and contains tables which are of great value.

Following are a few of the subjects treated: The metric system; chemistry and electrochemistry; magnetic quantities; laws of magnetic circuit; condensers; size of wire for telegraph and telephone lines; direct current generators and motors; batteries (of all kinds); alternators; transformers; wattmeters; electric lighting; wiring; electro-plating; electric heating; electric welding, etc.

There is a great satisfaction in the possession of a copy of this book because it contains so much valuable information for the practicing engineer and the student, and the matter is so well gotten up and the illustrations are so clear and correct that one can rest assured that he has the best information obtainable. This is one of the books published by the International Textbook Company. The price is 50 cents per copy. Copies are for sale by Telegraph and Telephone Age, 253 Broadway, New York.

The Old-Time Telegraphers of New Brunswick, N. J., held their annual reunion and banquet in that city January 31. W. H. Everson is president; A. F. Randolph, secretary, and George V. Phillips, treasurer.

Telegraph Competition vs. Goverment Ownership.

In the annual report of Mr. Clarence H. Mackay, president of the Mackay Companies, that gentleman refers to a paper addressed by him to the joint committee on Interstate Commerce, which is investigating the relations of all inter-state quasi-public corporations toward the public, including telegraph and cable companies.

The communication is addressed to Hon. Francis G. Newlands, chairman of the committee referred to, and takes up the subjects of "efficiency of the existing system," and government ownership. The paper, on account of its great importance, is herewith reproduced:

The telegraph service of this country, Mr. Mackay says, is thoroughly efficient. It is supplied by two strong competing organizations. Government ownership would, of course, mean the elimination of competition because the government would not allow any one or any corporation to compete with the government service. The present strenuous competition between the Postal Telegraph-Cable Company and the Western Union Telegraph Company has resulted in giving a higher and better class of service than government ownership ever could or would be expected to give in this country. This American telegraph service is admittedly far superior to any telegraph service given in Europe, where government ownership of telegraphs prevails. By the Postal Telegraph-Cable Company a twenty-minute service is given from sender to addressee between all large cities. Ninety-five per cent. of its telegraph staff started as messengers or operators and are familiar with every branch of the service.

The American telegraph service is very fast. The ordinary government telegraph service in Europe is slow and poor. In Europe any one who wishes fast service equal to that of the American telegraph service, must pay three times the regular ordinary rate. The National Association of Public Service and Railroad Commissioners of the various states held in San Francisco, October 12, 1915, received a report of its Committee on Telephone and Telegraph Rates and Service containing the following:

> "As far as this committee is informed, there seems to be no complaint on the part of the public as to the service and rates of telegraph companies."

Telegraph rates in the United States are cheaper than anywhere else in the world. This is not generally understood, because the published rate abroad seems cheap until one ascertains that every word in the address, signature, etc., is charged for, as well as every word in the body of the message. In the United States only the words in the body of the message are charged for. Now, there are fourteen words on the average in the address, signature, etc., in a telegram, in addition to the words in the body of the message. So that the European pays for fourteen words in every telegram for which there is no charge in the United States. The following table gives the comparative toll on telegrams of equal length:

	Average Charge for a Domestic or Intrastate Telegram Containing Ten Text Words
France	$0.23
Norway	.32
Sweden	.32
New Zealand	.24
Great Britain	.30
Germany	.28
Italy	.25
Denmark	.32
Austria	.29
United States	.25 to $0.30

This table is for intrastate telegrams. While the average rate for interstate telegrams in the United States is higher, yet any comparison of these should be made with international rates in Europe, as the interchange of messages between our different states is similar to the interchange of messages between the different countries in Europe. From Paris to Vienna is about 650 miles, and the cost for a 15-word message, address and signature charged for, is 57.9 cents, as against only 40 cents, address and signature free, for a similar distance in the United States. From Stockholm to Paris (1,000 miles) the rate for a 15-word message, address and signature charged for, is 72.4 cents. From New York to Chicago, about the same distance, the rate for a 10-word message, address and signature free, is 50 cents. Here, again, the American rates are vastly cheaper, notwithstanding the vast disparity between the distances in the United States and in Europe, as is shown by the following table:

	Area in Square Miles	Per Cent. of U. S.
United States	3,026,789	100.0
Austria	115,800	3.8
Denmark	14,800	.5
France	207,000	6.8
German Empire	208,800	6.9
Great Britain	121,400	4.0
Italy	110,700	3.7
Norway	124,100	4.1
Sweden	172,900	5.7

The foregoing table shows on its face that in Europe the revenue per mile of wire must be many times greater than in the United States, and hence the proportion of upkeep to revenue is much less in Europe than in the United States. For instance, the average telegram in the United States traverses 570 miles and night letters 1,025 miles, while in Belgium the average traverses but 42.5 miles and in Great Britain 150 miles.

There are still other equally important items. The American telegraph companies send messengers to collect and deliver telegrams and maintain call-box systems. The American companies keep open accounts for their customers and keep offices in hotels, apartment houses and competitive offices in all parts of large cities. The European governments do nothing of this kind. There the telegram must be taken to the telegraph office; the sender cannot run up an account; he must prepay, and may have to go a long distance before finding a main or branch office.

(To be continued)

To surrender to disappointment without resisting, to commit suicide to escape from it, is to abandon the field of battle without having gained a victory.

Annual Report of The Mackay Companies.

The annual meeting of The Mackay Companies was held in Boston, February 15. In his annual report President Clarence H. Mackay says:

"The year 1916 has been a year of extraordinary prosperity in the United States. Telegraph and cable lines naturally benefit by great business activity, involving speedy communications and quick transactions, and the past year has proved no exception to this rule. A higher rate of dividends and interest even from the best of securities is now necessary if such securities are to retain a reasonable market value and satisfy investors, and as the earnings of your company fully warrant, your trustees have under consideration the advisability of increasing the dividend upon the common shares from 5 per cent. to 6 per cent. per annum, or 1½ per cent. per quarter instead of 1¼ per cent. hitherto paid.

"The long-distance telephone business transacted by the Postal Telegraph-Cable Company has increased greatly during the past year. It is a by-product, being transmitted over wires which are used at the same time for telegraph purposes. In this respect it resembles the use of telephone wires by the Bell Telephone Company for telegraph purposes, that being considered a by-product by that company. The Postal Telegraph-Cable Company finds that its long-distance telephone service not only brings in fresh income, but helps telegraph business, especially as its rates for long-distance telephone communications are generally cheaper than those of the Bell Company.

"This report is accompanied by a copy of a paper addressed by the president of your companies to the Joint Committee of Congress, which is investigating the relations of all inter-state quasi-public corporations toward the public, including telegraph and cable companies. That paper, in addition to discussing the question of government ownership, sets forth the policy of the Postal Telegraph-Cable Company in regard to contracts with railroad companies. It points out that the usual terms of such contracts are absolutely unfair towards the telegraph companies, and that the Postal Company will make no more of such contracts. The most objectionable feature of these contracts is the large amount of free telegraph service given by them to the railroad companies. Furthermore, the Interstate Commerce Commission on March 28, 1916, made a ruling that the usual provision in this class of contracts, by which the telegraph company gives to the railroad company a large amount of free telegraph service and the railroad company gives the telegraph company a less amount of free railroad service, is illegal under the Interstate Commerce Act and cannot legally be carried out. The Postal Telegraph-Cable Company is endeavoring to enforce that ruling, and, in fact, is carrying on a test case in the courts to establish its legality and binding effect. If the ruling be sustained it will correct one of the worst abuses in telegraph and railroad practices that has survived the application of the Interstate Commerce Act. Furthermore, the telegraph service given by the railroad companies under these contracts has been poor, bringing the telegraph company itself into disrepute and causing many damage suits to be brought on account of the delays and errors in the telegraph service performed by the railroad.

"The present outburst of business prosperity has demonstrated the wisdom of the policy of the Postal Telegraph-Cable Company in withdrawing about two years ago from the leased wire business, especially with brokers. It was a bold and startling departure from established practice in the telegraph business, and when this policy was announced and carried out, it looked like the sacrifice of a large income, but it has now been demonstrated that the Postal Telegraph-Cable Company could not give the more profitable fast and perfect telegraph service it now gives if it were still leasing its wires. In fact, in order to give proper service, the Postal Company has been obliged to withdraw leases which were not withdrawn two years ago—notably one from Chicago to San Francisco to the Associated Press, which lease was canceled by your telegraph company in October, 1916, as allowed by the terms of the contract itself, thereby enabling the company to continue and expand its rapid service to the Pacific Coast.

"Out of the dark background of the war the value and stability of submarine cable property stands out prominently. The service which it is rendering is inestimable. In the prime factors of secrecy, speed and accuracy it has no rival. Its position is strengthened rather than weakened by the results of wireless telegraphy. The few weak incursions of wireless into the wire domain are only of momentary interest.

"On November 15, 1916, the Marconi Wireless Telegraph Company announced a wireless telegraph service between San Francisco and Japan in competition with the Commercial Pacific Cable Company. The result of this competition up to the present time has not had any appreciable effect upon the Commercial Pacific Company's traffic. Your trustees, while keeping in close touch with the developments of wireless, have no reason to alter their previously expressed views regarding the effect of this mode of communication upon our future prosperity. There is no reason to believe that the wireless can ever render a service as reliable as that of the submarine cables. Reliability and accuracy plus speed are the cardinal principles of the transmission of intelligence, and all three are to be found in their highest degree in the submarine cable.

"During the past year a large portion of one of the Commercial Cable Company's main cables was renewed in deep water, the expense thereof being paid out of the company's revenue. Advances and improvements are constantly being made in cable communication and your cable company is not idle in this direction. Further developments are in sight.

"Your land line and ocean companies, in common with other industries, have felt the enormous increases in the cost of all materials and labor entering into their operating expenses. So far, however, the increased traffic has taken care of these increased costs.

"During the past year Lord Shaughnessy, of Ashford and Montreal, was elected a trustee of your companies. Lord Shaughnessy is president of the Canadian Pacific Railway Company, and his acceptance of the position of a trustee of your companies is a further guarantee of the permanence, independence and efficiency of your system.

The surplus and reserve of your system have been increased during the past year and are invested in government securities of the highest class. We know of no other great quasi-public institution in the United States that occupies quite so strong a financial position.

The employes of the Commercial Cable and Postal Telegraph systems are continually increasing their holdings of shares in The Mackay Companies.

To meet the large increase in the cost of living felt by the employes of the Commercial Cable and Postal Telegraph Companies, these companies have granted bonuses and liberal increases in salaries.

PROFIT AND LOSS ACCOUNT.

For the year February 1, 1916, to February 1, 1917.

RECEIPTS:		
Income from investments in other companies		$4,683,265.30
DISBURSEMENTS:		
Dividends paid on		
The Mackay Companies Preferred shares	$2,000,000.00	
Common shares	2,069,020.00	
Oper. expense, including Federal Income Tax, Transfer Agents, Registrars, Auditors' and Trustees' compensation, office rent, salaries, stationery, engraving of certificates, etc.	56,799.66	
Balance carried forw'd	557,445.64	
		$4,683,265.30

BALANCE SHEET.

ASSETS:		
Investm'ts in other cos.	$92,005,444.90	
Cash	1,288,299.67	
LIABILITIES:		$93,293,744.57
Preferred shares issued	$50,000,000.00	
Common shares issued	41,380,400.00	
Surplus	1,913,344.57	
		$93,293,744.57

SCHOOL NAMED AFTER MR. EDISON.—A school in Salt Lake City, Utah, has been renamed after Mr. T. A. Edison. Mr. Edison telegraphed his appreciation of the honor.

BOYS ARE BOYS THE WORLD OVER. — American boys are not the only ones who take delight in throwing stones at telegraph and telephone insulators; English boys are guilty of the same offense. Seven youths were recently fined in one English court for destroying insulators, and in another court five young boys were mulcted for a like offense.

Mr. Edison's Birthday Party.

In our February 16 issue brief reference was made to the celebration of Mr. T. A. Edison's seventieth birthday at the Edison works in West Orange, N. J., on February 10. A large birthday cake was presented to him by Mr. J. W. Lieb, vice-president of the New York Edison Company. It was forty inches in diameter and forty inches high and contained seventy miniature electric candles, lighted from Edison storage batteries. On the top of the cake was a figure of Liberty, holding a torch lighted by a small incandescent lamp.

Vocal and instrumental talent was provided by the artists and employes connected with the affiliated Edison interests, and throughout the dinner selections were rendered by the Edison employes' band. The festivities were brought to a close by an exhibition of feature films in the Edison studio.

Among those present were Henry Ford, John W. Lieb, Charles P. Bruch, W. J. Hammer, W. H. Meadowcroft, W. W. Freeman, J. H. McGraw, C. H. Wilson, Newcomb Carlton, T. A. Edison, Jr., Dr. S. S. Wheeler, E. H. Johnson, A. D. Page, A. B. Chandler, W. E. Gilmore and many others well-known in the electrical industries.

Destitute Negroes in the South.

BY A. J. JENKINS, LETOHATCHIE, ALA.

Permit me to thank you for reference in your valuable paper of February 1 in which you make mention of the fact that while I am a member of the Old Time Telegraphers and Historical Association I am chairman of a citizens committee to secure aid for destitute negroes of Lowndes County.

Allow me to say I have been, and am still in "harness," having been manager for the Western Union for over thirty years.

The condition of the poor, especially the helpless negroes, on account of total crop failure of last year is simply indescribable. The great and good order of Red Cross of America through their field agent Mr. W. M. McGrath and myself, as chairman of this committee also, have been issuing rations to the destitute here for several weeks, and it is indeed a pitiable sight to see hundreds of these poor people, some of them coming for miles over muddy and frozen roads, many of them barefooted and in rags to secure these meager rations that are issued weekly.

This has been the severest winter the South has experienced in years, and it is easy to understand that the exposure and extreme cold weather has caused much sickness and suffering.

There is no getting away from the fact that but for the timely aid of the Red Cross many of these poor would have starved to death.

If any kind friend wishes to contribute any thing to the relief of these sufferers the committee through me would be pleased to hear from them, as funds are badly needed with which to purchase medicine, shoes and clothing.

A "YOUTHFUL" MESSENGER.—A telegraph company has a messenger in its Pittsburgh, Pa., office who is seventy-two years of age and is said to be one of the best "boys" on the force.

Wireless Telegraphy.

BY E. B. PILLSBURY, GENERAL SUPERINTENDENT, MARCONI WIRELESS TELEGRAPH COMPANY OF AMERICA, NEW YORK.

(Concluded from page 82, February 16.)

Radio-telegraphy is a most potent factor for naval, military and airship use in the present war. On July 30, 1914, five days before the actual declaration of war, the English fleet, which had just left Portland, was recalled by wireless; and on August 4, 1914, Germany flung around the world on its chain of wireless stations this vital message to its mercantile marine: "War declared on England; make as quickly as you can for neutral port." This first dispatch unquestionably saved Germany many millions of dollars of property and secured for possible future use a fleet of passenger and cargo boats which may yet play a great part in her recovery from war's ravages.

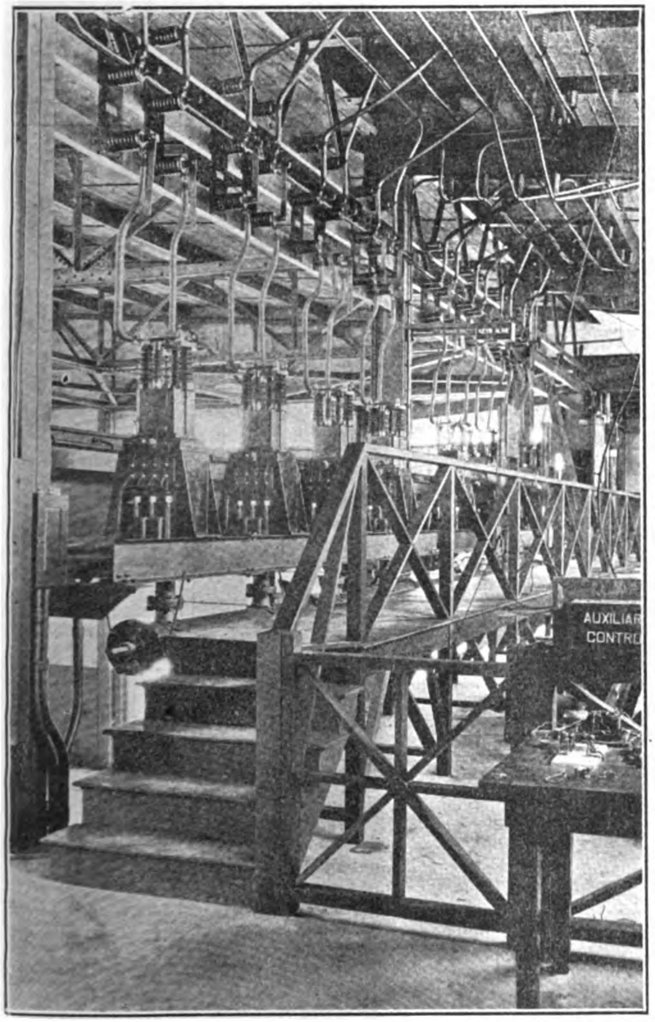


FIG. 5—HIGH-SPEED AUTOMATIC SENDING KEYS AND BUSSES IN TRANSMITTING STATION.

As long distance wireless rang up the curtain on the greatest war the world has yet witnessed, so it has continued to play a great part therein. One of the most striking points in connection with wireless, which has been developed by the war, is that public attention has been directed upon it as never before, owing to the fact that so much of the official communications, particularly German information, has been brought to the notice of newspaper readers through this medium, owing to obstruction of the German cables.

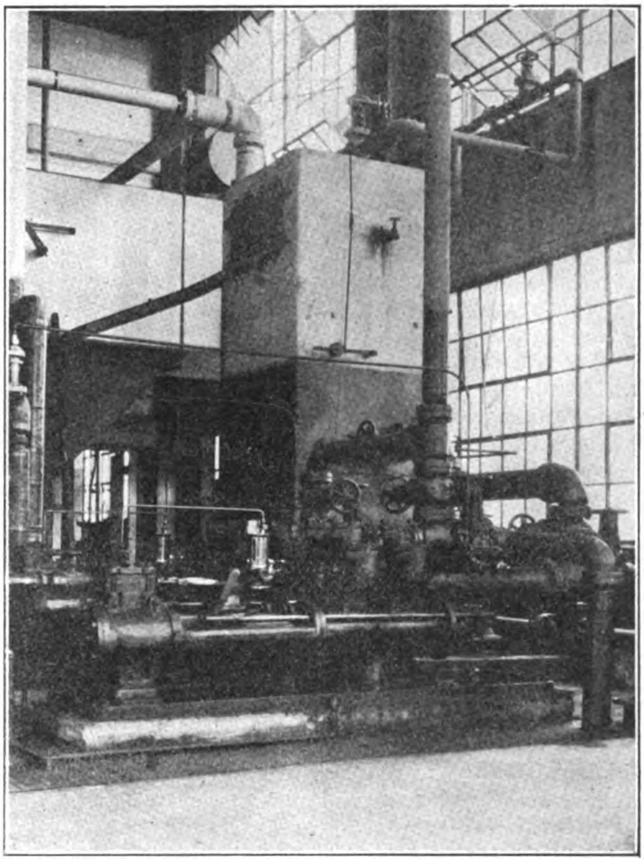


FIG. 6—CONDENSER AND STEAM PUMPS IN MARCONI POWER HOUSE.

One of the objections made against wireless telegraphy is in regard to the possibility of interference between various stations and the confusion likely to arise when a number of stations are simultaneously operated in the vicinity of one another. Although this confusion does rarely arise in practice with proper up-to-date stations and apparatus, yet even with the old instruments when it did occur it was not by any means such a serious matter as generally appeared to the imagination of the public. In most countries the operation of wireless telegraph stations in regard to ship and shore communication is subject to judicious rules tending to prevent mutual interference. It is well known that without proper organization and discipline, serious difficulties due to interference would occur with the great majority of ordinary land wire telegraphs which work several offices by means of a single wire. In the case of wireless telegraphy it is often an advantage that any station should be able to pick up a message which may not be actually addressed to it, as, for instance, in the case of a ship in distress calling for assistance. The most practical method of isolating any particular receiver so as to make it sensitive only to signals coming from a certain station lies in the principles of resonance; that is, to tune the sending and receiving circuits in exact correspondence.

When the war broke out a German company had high-power stations in communication between Sayville, L. I., and Nauen, Prussia (3,262 miles), and between Tuckerton, N. J., and Eilvese, Prussia (3,383 miles). In order to protect our neutrality the American government took over these stations and is now operating them in the interests of the owners.

The government has erected a high-power station at Arlington, within sight of the capitol at Washington, with a radius of 3,000 miles under ordinary conditions. It represents the first step of the Navy toward the establishment of a great chain of high-power wireless stations to girdle the earth and bring the Navy Department into direct communication with the fleet throughout the length and breadth of the seas. Unless a war vessel be in the Arctic, Antarctic or Indian Oceans, it will be at all times within the range of one of the seven contemplated stations, the other six of which are to be located at San Francisco, Honolulu, Manila, Guam, Panama and Samoa.

From the Arlington station messages can be sent to vessels stationed beyond the Azores, to the western shores of Europe, to Madeira, Cape Verde, the mouth of the Amazon, Panama, the Galapagos Islands off the western coast of Ecuador, and Magdalena Bay. The radius also embraces through the chain San Francisco and the whole stretch of the California, Washington and Oregon coasts, the lonely wastes of Upper Canada, Hudson's Bay and the southern nose of Greenland, the entire Caribbean Sea, all of the West Indies, most of Peru, all of Colombia, Venezuela, the three Guianas and the watershed of the Amazon; and all of the United States, Mexico and the Central American Republics are within the range of these stations. Weather reports and time signals and also information in regard to ice, obstructions to navigation, etc., are sent out broadcast for the information of navigators.

The success of Marconi in effecting transoceanic communication was a startling achievement. Regular message traffic has been transmitted between Europe and America continually for more than eight years over a duplex wireless circuit between Clifden and Glace Bay; that is to say, messages between these points are transmitted in either direction simultaneously. The transmitting and receiving apparatus of a station are not placed close together, but in separate stations a number of miles apart, connected by land wires which make it possible to locate the sending and receiving operators in the same room. The receiving instruments are coupled to two distinct aerials, one of which is used for receiving, while the other, which is known as the balancing aerial, is so arranged that it is practically unaffected by the signals from the distant station from which it is desired to receive. The effect produced by the balancing aerial on the receiving apparatus by the adjacent transmitter is equal and opposite to that produced thereby through the receiving aerial, which is tuned to the periodicity of the signals it is desired to receive.

The latest type of receiving apparatus greatly minimizes the interference to which wireless transmission over long distance was particularly exposed in the early days. The signals arriving in Glace Bay from Clifden are, as a rule, easily read through any ordinary electric atmospheric disturbances. This strengthening of the received signals has, moreover, made possible the use of recording instruments, which not only give a fixed record of received messages, but are also capable of being operated at a much higher rate of speed than could ever be obtained by means of an operator reading by sound or sight. The gramophone is made to do the receiving by inserting into it the wireless telephone, thus transferring the incoming signals to the wax record, which may be revolved at maximum speed and when filled removed to another gramophone speeded down to suit the capacity of the operator. High speed in transmitting is attained by substitution of the Wheatstone automatic transmitter, using perforated paper tape, for hand transmission.

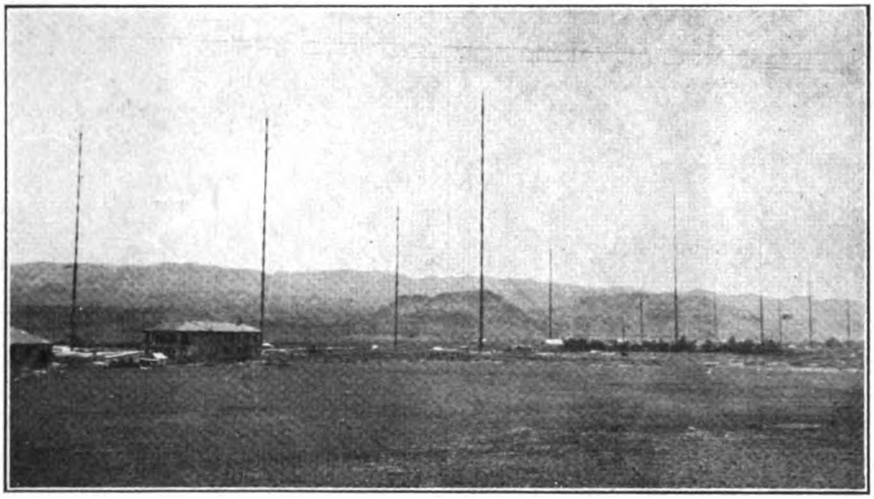


FIG. 7—MARCONI TRANSMITTING STATION, KAHUKU, HAWAII.

The American Marconi Company has taken the lead in wireless developments on this continent and has for its president the Hon. John W. Griggs, formerly attorney-general of the United States. The company has established a chain of shore stations covering the Atlantic, Pacific and Gulf coasts and the Great Lakes, making it possible for ships to keep in touch with land practically continuously. The semi-high power station at South Wellfleet, on the end of Cape Cod, communicates with liners until they are half-way across the Atlantic, when they are able to pick up the corresponding station at Poldhu. It is from the South Wellfleet station that news matter is sent out broadcast every night, enabling ships to print daily newspapers at sea. Marconi stations located in Alaska maintain continuous communication with Seattle, while a high-power station near San Francisco exchanges a large volume of commercial traffic with Honolulu. This latter station is now preparing to inaugurate direct service with Japan which will span the Pacific, a stretch of 5,434 miles, it being 2,079 from San Francisco to Honolulu and 3,355 miles from Honolulu to Japan. It is not improbable that Honolulu will be in wireless touch with Australia in the near future.

Ships are equipped and operators furnished by the Marconi Company, which manufactures and rents the apparatus to the steamship companies. The apparatus requires frequent inspection and at times repairs or renewals. By retaining control over operators and equipment, the Marconi Company is enabled to maintain the equipment at the maximum of efficiency anl insure satisfactory communication with other ships and with shore stations. This could not be accomplished were the set to be sold outright and ships permitted to furnish their own operators.

The International Radio Telegraphic Convention was concluded in London between all nations on July 5, 1912, and the set of regulations then adopted for the guidance and control of wireless telegraphy is known as the London Convention. It regulates the organization and hours of service of stations, the form of messages, the charges, the routing, transmission and delivery of messages, the accounting, signaling of ships and stations, etc., etc., and has the backing of all governments and must be adhered to strictly by employes of governments and commercial companies. With this convention as a basis of operation all over the world, disagreements and delays are reduced to a minimum, while the possible benefits of the science are greatly promoted.

Guglielmo Marconi was born at Bologna, Italy, April 25, 1874, being Irish on his mother's side. He was educated at Leghorn and Bologna University and first interested himself in wireless telegraphy in 1895. In the year following he went to England and took out the first patent ever granted for a practical system of wireless telegraphy by the use of electric waves and his wonderful accomplishments since are universally known. At present he is in active control of wireless operations in the Italian army and navy. His work has been recognized by many governments and seats of learning; he has been decorated by the King of Italy and made a life senator, and he has been decorated by the Emperor of Russia. He is an honorary doctor of many universities, including Oxford, Glasgow, Aberdeen, Liverpool and Pennsylvania, besides having received the freedom of the principal Italian cities. In 1909 he was accorded what is perhaps the highest distinction that can be obtained by any scientist, the Nobel prize for physics, and he holds many scientific awards granted by various societies and institutions. The King of England has bestowed on him the honorary knighthood of the Grand Cross of the Victorian Order.

During the quarter of a century since Hertz made his famous discovery of electric waves, radiotelegraphy has made many substantial advances toward the goal of perfection and it stands today a conspicuous and brilliant example among the many resources which science has contributed to modern civilization.

Location of Main Operating Rooms.

BY "TEXAS."

Has not the time arrived when the relay offices of the class that handle a million or more messages per month should be more properly located in a suburban district convenient to street car lines and trackage conveniences, in buildings specially constructed for the needs of a telegraph company and its employes. Would not the following plan be of much value to the general interests and welfare of both the company and its employes?:

A site, suitably selected, containing fifty or more acres, plotted into half acre or one acre tracts, to be sold to employes of the company on instalment payments, at a fair price, yet one that would yield enough profit to the company to pay for much of the improvements and for the company's own building which should be suitably located on a large lot, say four or five hundred feet square, with suitable parkings, lawns, shade trees, flowers, sidewalks and drives; the main building to have a basement and two stories; the operating room to be large enough for all its uses on one floor and one room, provided with proper light, ventilation, and all that goes to make it comfortable, sanitary, and a pleasant place to work.

The large lots would afford ample room for good dwellings, truck garden spot or chicken raising, thus giving each man of family some place to interest himself while not on duty. The majority of employes thus segregated would at all times be within easy call for emergency, eliminating any cause for loitering about town. By having in a company store or a cooperatively managed store, everything ordinarily used and required, there would be little need to leave a village erected on this plan. This should prove a success toward the improvement of quality and efficiency of the employes, making them feel more secure and content, and cause them to consider their employment with such a company more seriously and earnestly.

The company would profit by the increased efficiency and moral quality of its employes; the organization would certainly take on much more of the loyalty and ambitious spirit. The decreased cost of office rentals as compared with usual downtown charges would be a considerable item in itself. Electric power is always within easy reach by power companies and interurban car lines.

Newspaper Beats.

BY WM. DE LA MOTTE, RED BANK, N. J.

I was much interested in the story in the December 16, 1916, issue of TELEGRAPH AND TELEPHONE AGE, under the caption "Newspaper Beats." It recalled to my memory an incident which happened in the nineties.

It was at the time of an international yacht race for the "American Cup." The trial races had been sailed and the real thing was on. Several newspaper reporters with plenty of copy-paper and sharpened pencils were on hand in the Western Union marine observatory at Sandy Hook. Some had come early and were writing up their introductory stories from what they had learned coming down the bay, or by rail, or was given to them by the marine observers, about the work on board the yachts, their movements, crew, hull and rigging, the weather, the sea, the course to be sailed, prospects of the race and what under the circumstances might be expected; in fact any thing that made good reading for the first edition of the afternoon papers.

Simultaneous with the early reports given to the Maritime Exchange, New York, Marine Department at 195 Broadway, the Associated Press, the United Press and the Sun's Laffan office over the marine wire, by the marine observer, the operators at the Highlands, N. J., and Quarantine, S. I., offices, took notice and gave information to those newspaper reporters who were sent there to gather the news of the race.

Other circuits were made up and intermediate offices instructed not to cut in or break, and direct wires to Boston, Chicago, Philadelphia, Baltimore and Washington, had been arranged for.

An office had been partitioned off, three flights of stairs below the regular office. Five or six of 195's best operators had arrived and were ready to rush the matter filed. One of the night observers took in the copy and handed it to the sending operators, with "file-time" on and signed.

The reporters had been informed that each file should be finished. No sheets were allowed to be put in the stack; first come, first served. They had been requested to file their introductory stories early so as to have the matter in the paper office in good shape; otherwise when the race was called these stories would obstruct the flow of flashes and bulletins. Everybody appeared pleased with this arrangement and for some time the New York men had kept the wires hot down stairs, when the receiver came running up the stairs and handed me two pages of one of the, at that time, much read "Seaside Library" stories and asked me, "What shall I do with that." A bunch of reporters followed him and the small office of the old square tower was somewhat crowded; all were listening.

I asked Ed. McCann, who took in the messages, what he meant. When he had regained his breath he said "this man," pointing to a reporter, "has filed it and wants it sent right away." "All right," I said; "go back to your post, and leave the file here," first taking a look all around the horizon and finding nothing to report.

The reporter who was a new man to me, and wrote for a New York evening paper was in a hurry to get his "Seaside Library" stuff off. Telling him to wait a moment, while I took another look out—I sparred for time, so to say—I then informed him that I could not send that matter at press rates. If he desired to have it sent it would go at commercial rates. I asked the reporter to show his credentials and proof that his office would be responsible for the amount if sent as a commercial message. I had to count the words. As he had no letter of introduction I asked him to deposit $100 and everything would be all right. That was a stickler. As no cash was forthcoming I laid the copy aside. The other reporters, who had listened to our conversation, gave three cheers for the failure of the scheme to block all other papers from getting their copy forwarded.

The race began and plenty of copy was filed and promptly sent to the newspaper office to which it was addressed. The cable was cleared for the final report and when the last yacht crossed the finishing line nearly every hook was clear and Mr. Jas. McParlan, of the Marine Department, told me afterward, that ninety-two seconds after the finish London had the news that the America's cup had good chances of remaining in this country.

I was happy that things turned out all right, and so seemed every one else. Then there was a rush for the boats to get back to New York, or interview the men on the racers, and soon after the tower was deserted by everyone except the observers. From top to bottom the floors and stairs were littered with waste papers, cigar butts, and cigarette ends, but it was soon cleaned up and we resumed our business of reporting vessels. Things looked all right but a cloud was gathering, and a message from "SU" to report at the office set me to thinking, and when next morning I saw Mr. J. J. Barry in Mr. W. C. Humstone's office, I was informed that Mr. W. B. Somerville desired me to call on him. A very sharp complaint had been made and I was in a fine mix.

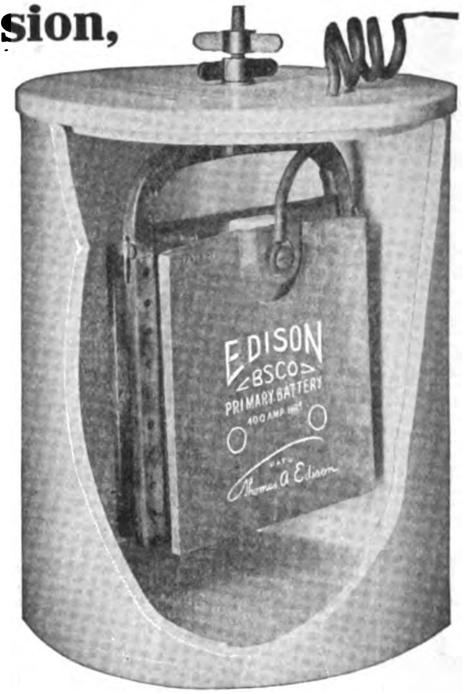
Mr. Somerville, who was superintendent of the press service, received me very nicely but was much put out on account of the complaint from a New York paper, and requested an immediate explanation, stating that I had acted against the rules of the company. I explained the case according to my reading of the rules, which held me responsible to the company for the tolls of every message sent. For this reason I had requested the deposit of one hundred dollars. This was not made and I could not afford to be checked on a message of such length.

I also told Mr. Somerville that I had scented the man's scheme, and had come to the conclusion that it would be better to retain the good will of all the other papers, than to permit one man to block their correspondence; the company could only gain thereby.

Mr. Somerville seemed pleased and said he would now be able to give the paper a proper explanation. Mr. Barry laughed outright when I returned to his office and told him about it; he thought it had looked pretty black for me.

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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THE RAILROAD.

Western Division Meeting.

The next meeting of the Western Division of the Association of Railway Telegraph Superintendents will be held at the LaSalle Hotel, Chicago, March 21. Mr. H. D. Teed, superintendent of telegraph of the Frisco Line, Springfield, Mo., is chairman of the Western Division. A large attendance is expected, as many important subjects will be taken up and discussed.

Next Convention of Association of Railway Telegraph Superintendents.

Those in charge of the arrangements for the next annual convention of the Association of Railway Telegraph Superintendents at Washington, D. C., September 18, 19 and 20, are busy with the work and there is every indication that the meeting will be a very successful one from the technical standpoint. President M. H. Clapp began the work of organizing for this meeting immediately after the adjournment of the St. Paul convention last year and it is his desire to make this year's gathering a profitable one to the members.

The association has some large problems before it for its attention and the various special committees are giving these matters prompt and proper consideration. The committees investigate and report their findings and recommendations in regard to anything which will promote the advancement of the efficiency of the telegraph, telephone and other electrical departments of the railroad service. Special Committee No. 6 covers telegraph and telephone development. It is composed of E. C. Keenan, chairman, general superintendent telegraph, New York Central Lines, New York; J. H. Finley, assistant manager, supply sales department, Automatic Electric Company, Chicago, Ill.; L. M. Jones, Topeka, Kan.; L. B. Foley, superintendent telegraph, Lackawanna Railroad, New York; T. R. Gooch, superintendent telegraph, Richmond, Fredericksburg and Potomac Railroad, Richmond, Va.; G. K. Heyer, railway sales engineer, Western Electric Company, New York; C. S. Rhoads, superintendent telegraph, Big Four, Indianapolis, Ind.; David Sarnoff, commercial manager, Marconi Wireless Telegraph Company of America, New York, and J. J. Ghegan, president, J. H. Bunnell & Company, New York.

The purpose of this committee is to keep the association in touch with all developments of the telegraph and telephone as they occur. Members of the association who desire to have general investigations made or who know of developments which would be interesting are invited to call the attention of the chairman or the members of the committee in regard to the same, in order that all questions may be properly and systematically handled.

Every member should give the officials encouragement in the prosecution of their work of upbuilding the association by rendering all the assistance possible.

Alternating Current Sounder and a New Word-Counter.

Mr. J. J. Ghegan, president of the J. H. Bunnell and Company, Inc., New York, has invented an alternating current sounder, so simple that it will probably greatly help in the solution of the local battery problem.

As is well known the high costs of material used in batteries has placed such a heavy expense on companies using this source of current and much attention has been given lately to the possibility of doing away with batteries altogether. This has been possible in many places by the use of box relays and instruments of that type.

In practically every community in the land alternating current is available, and in order to utilize this class of current, direct from the mains, Mr. Ghegan has devised the alternating current sounder, which offers a complete solution of the local battery problem.

The instrument looks like an ordinary sounder with a permanent magnet attached. The magnets are solenoids, the cores being movable, like a piston, and not fixed as in the ordinary direct current sounder.

The instrument works as well on an alternating current circuit as the ordinary sounder does on direct current, and no one would know the difference if the facts were not known.

Mr. Ghegan has also arranged a word-counter for typewriters that is much superior to any on the market. It is extremely compact and finished to correspond with the typewriter frame. It is entirely out of the way of the operator. The main advantage of this counter is that it can be set back to zero instantly when a piece of work is finished. It registers 99999 words, and is so simple and strongly made that it cannot possibly get out of order.

Daylight Saving in Germany.

The German authorities are evidently well pleased with the results of their experience of last year in the daylight saving plan, as they have decided to begin it earlier this year. They will start it April 15 instead of May 1, and the schedule will continue until September 15.

FROM MINISTRY TO MESSENGER.—An ex-minister of the gospel recently applied to the manager of the telegraph office at Youngstown, Ohio, for a position as messenger. He was left stranded through the consolidation of his with other churches in Garrettsville, Ohio.

A WEALTHY MESSENGER. — John Donohue, a sixty-year-old telegraph messenger in Brooklyn, N. Y., has brought an action against his wife for an accounting, alleging that she has in her possession money and property valued at many thousands of dollars which the couple had accumulated.

ICELAND.—The legal time of Iceland was advanced one hour on February 20.

Efficiency Engineering in the Telegraph Service.

(Continued from page 84, February 16.)

System is one of the foundation stones that lead to success. System means method and somewhat differs from efficiency. The two, however, are closely related. It is well to have more to say at this time on the subject of system because so many lack this necessary qualification of success. Without system imagine how far astray an architect would wander in constructing a building. His plans and specifications must be accurate or the structure will be wobbly. It is the same with an individual. If he lacks system his course through life is wobbly. System means the keeping of records, whether personal or business, in such a way that leaks at once will be discovered. Leaks mean waste, and if permitted to exist and grow will inevitably lead to bankruptcy. An efficiency engineer is engaged to ferret out leaks and stop them regardless of friendship for those affected by changes suggested. He is supposed to point out to the owners of a property how it is possible to obtain value received for every dollar expended. No man can do business on guess-work. If he does the increased expenses that will surely grow on him will eat him up alive.

The manager of an office, whether telegraph or telephone, should know who his reliable employes are. Some are natural money-makers for the company, others are drones and have to be constantly watched. It takes time to supervise the careless employe and steps should be taken to win him over to a realization of the important position he occupies in the company's service or he should be placed where his record will not drag down the efficiency of the entire staff. If an employe does not understand what system means he should be given the alternative of mending his ways or vacating his position. It is not sufficient for an operator to receive a message and then let it lay on the table. It is necessary that it should be placed where the check boy will see it and rush it to the delivery department where the company expects both system and method to aid in the speedy delivery of the message to the addressee. The company is paid for service, efficient service. System and method produce efficient service.

A telegraph man once informed us that he had a wife and one son and carried $12,000 worth of insurance. He drew an operator's salary. He was largely over-insured but he did not realize it. In reality he could not afford to carry one-half of the amount and he was compelled to burn the candle of life at both ends, working extra to meet the premiums. He lacked system. It is just as necessary that this individual should reduce his insurance as it would be to reduce any other form of an unnecessary expenditure. Every man should control his expenses and see that they are properly proportioned and not permitted to get out of unison with his income.

If an individual lacks system in keeping track of his own accounts, how can he be expected to manage the affairs of a large corporation. Lack of system has caused many good men to lose their positions.

A superintendent once informed us that he wrote to a manager and the letter contained five questions that required specific replies. The manager no doubt read the letter, laid it aside and then proceeded to answer it. He answered two of the questions satisfactorily but made no reference to the other three. Another letter was sent to the manager, calling attention to the omissions. Then the astonishing answer was returned that he had relied upon memory when he wrote his answer. Let us place ourselves in the position of the superintendent. Would we feel inclined to overlook the shortcomings of the manager in question or would we watch him to see that he did not trust to memory on more important matters connected with the service? The manager lacked system. He should have answered the superintendent's letter line by line and taken no chances in overlooking a single sentence.

Another manager received a large box containing office supplies and stationary. He called one of the messengers and told him to open the box and distribute the contents. Two weeks later the manager was informed that there was no more of a certain line of stationary on hand. He made urgent requisition to the supply department through the usual channels for another supply of material. The purchasing department returned the requisition stating that the previous shipment contained at least six months supply of the material required and he was asked to state what had become of it. After a thorough search of the office it was discovered that the messenger boy who opened the box had placed this material where it was not likely to be found again. The contents of the box were never checked up, the manager had no idea what he had received although he was supposed to acknowledge the receipt of each of the different items. The messenger boy was only too anxious to shelve the goods and get them out of the way as quickly as possible. The manager was forced to acknowledge that he was hasty in asking for another supply of material of which he had sufficient on hand to meet all reasonable demand for six months to come. What kind of an impression did the manager make on the supply department people? If they had reported him as lacking in system would they have done him an injustice?

It is all well and good to refer to these cases as trivial. They are mentioned here because they are trivial. If a manager does not look after the trifles, is he competent to look after the larger items that go to complete a telegraph or a telephone office?

(To be continued)

Mr. F. S. Meek, manager, Postal Telegraph-Cable Company, Owensboro, Ky., writes: "I thank you for automatically renewing my subscription. Never permit the paper to lapse. It would indeed be missed, as we look forward to its coming, as it surely does contain information that we in towns of this size would otherwise never know."

Stephen Berry One of the Two Oldest Operators.

Stephen Berry, of Portland, Me., is one of the two oldest members of the telegraph profession. He and Joseph S. Greene, of Philadelphia, learned telegraphy in 1846, just two years after the first experimental line was established between Washington and Baltimore. It required the intervening two years to construct the telegraph lines to Philadelphia, New York and Boston. In 1845 the first wires were finished to Philadelphia and New York and were extended to Boston in 1846. Mr. Berry is still very active and bids fair to live for many years to come. His telegraph career is interesting and as written by himself is as follows:

I was born in Augusta, Me., December 21, 1833, where my father was publishing the *Age*, in partnership with Francis O. J. Smith, as a Democratic state paper. My first knowledge of the telegraph was seeing experiments with a sub soil plough in laying lead pipe in the fields of F. O. J. Smith, in Westbrook, now Portland. He thus anticipated the most improved system of the present time, in laying wires underground. But his scheme proved ineffective at that time. In the spring of 1846 I learned telegraphy in the first Boston office, which was situated on the south side of Washington street, a little above Corn Hill.

My first appointment was as operator on the Lowell line, and Miss Strong, a sister of the Springfield operator, was the operator at Lowell. The line was built by an army officer, who was ordered off to the Mexican war and the line was shut down. In the autumn of 1846 I went to Albany and Troy, N. Y., with G. Q. Colton, a lecturer on the telegraph, who engaged me as operator and advertised me on the posters as thirteen years old. I was with him three months, and during that time I met Professor Morse and had a talk with him. He advised me to stick to telegraphy as it would be a great business.

In 1847 I went on the Newburyport line.

In 1848 my father went to Portland to take charge of the Portland office and I went with the family. The Maine line was then being built and I taught the operators in Bath, Belfast and Eastport, who came to me for the purpose of learning. I had had a wide experience by this time, even in repairing lines, which was largely imposed upon the operators at that time. In the great ice storm of February, 1848, our copper wires in the City of Boston were all broken down and had to be replaced with iron wire. The slaters refused to work on the roofs at that time of the year, as we attempted to persuade them to do, and we had to do the work ourselves. In company with a lineman of the Portland line, I helped replace the Newburyport wire. It was a cold and a difficult job, and somewhat dangerous. As I was a lightweight I was the one to be let down to the eaves of tall buildings with a rope around me when it was necessary. After sixty-nine years I recall the hair curling experience on a tall building in Haymarket Square, when pieces of ice were sliding down the roof and falling to the street below. Near the close of our job we engaged an Irishman to assist us, but at the end of the first day he left us without a word, too frightened at the risks which he thought we ran.

At another time, in company with Moses G. Farmer, the inventor of the fire-alarm, who then had the Salem office, I went on foot from Newburyport to Boston, repairing the line.

In 1849 I was sent to Worcester to straighten out the office. There were two inexperienced operators there, and the office was out of commission. I found the difficulty in their local battery which had given out. As they had never heard of a local battery, I stayed there a month instructing them.

In January, 1851, I was given charge of the Portland office of the Bain line, which was run under the Bain system to accommodate the Associated Press, on account of a quarrel between D. H. Craig of the Associated Press and F. O. J. Smith. I remained there until May 26, 1854, when the line was closed by injunction. There was one vacancy on the American line which my assistant James G. Smith wished to take on account of remaining in Portland where he was engaged to the young lady whom he afterwards married. I gave way to him and he afterwards became superintendent of the line, while I went on to a daily paper, the *State of Maine,* having charge of the counting room. I had been acting as agent of the Associated Press for some time, and while I left the telegraph business I retained connection with the Associated Press. I was appointed state agent and remained in this position forty-five years, when the western association overcame the New York association and the New England papers had to fall in line, and I dropped out from the *State of Maine.* I joined my father in a job printing business. He was elected grand secretary of the Masons in 1855 and 1856 and gradually dropped out of the printing business, leaving it all to me. I was appointed assistant grand secretary in 1856 and when my father died, in 1891, I was elected his successor. For a quarter of a century I have devoted myself to masonry, and have found the work very congenial.

MATHEMATICS FOR THE PRACTICAL MAN is the title of a very valuable and useful book for practical men, students or engineers. It is not intended to teach arithmetic or higher mathematics but presupposes that a man already has a working knowledge of these subjects. From that point the mathematics are treated in a popular way and the book enables one to readily understand the subject. It is a book of examples and explanations rather than one of instruction, and every telegraph and telephone student and engineer will find it very useful in the prosecution of his studies and in his every day work. It covers fundamentals of algebra, some elements of geometry, principles of trigonometry, logarithms, principles of co-ordinate geometry, and principles of the calculus. A careful study of this book gives one a deep insight into the beauties of mathematics. The price of this work is $1.25 per copy. Copies may be purchased of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy, radio telegraphy and telephony, standard works have been freely drawn on for the substance. The questions following each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The subsequent articles will be made up in the same manner, and the series will be continuous and in logical order.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr. "Radiotelegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

POLARIZATION.

The cause of the rapid fall in the strength of current in "open" circuit batteries, is chiefly attributable to an action within the cell which is termed polarization.

This term, polarization, in this relation, may be taken to signify a counter-electromotive force that is set up in the cell; that is, a force tending to oppose the original electromotive force of the cell. The cause of polarization may be explained as follows:

The difference of electro-chemical potential between some of the metals, and some of the metals and gases is very slight. For example, the electrochemical difference between zinc and hydrogen is very small; sometimes the hydrogen is found to be electro-positive to the zinc. When an electric current passes through the solution or "electrolyte," as it is also termed, of a cell, a chemical decomposition and recombination of the components of the solution takes place. Thus, in the case of a simple voltaic cell whose zinc and copper elements are placed in a solution of dilute sulphuric acid, it is assumed that the oxygen of the solution combines with the zinc, forming oxide of zinc, which, uniting with the sulphuric acid of the solution forms sulphate of zinc, setting free hydrogen, which is deposited on the copper or negative plate.

The effect of this deposition of hydrogen on the negative, or copper plate, is to oppose to the zinc plate an element having an electro-chemical state or level nearly equal to its own, the consequence of which is that when sufficient hydrogen has accumulated on the copper plate, practically no current flows into or from the cell. When this has occurred the cell is said to be polarized.

That the falling-off in the current is due chiefly to this cause, namely, the accumulation of hydrogen on the negative plate, may be shown by removing the hydrogen bubbles which have gathered on the negative plate by means of a brush, or by shaking that plate in the cell, when the current will be found to increase temporarily. Or, it may be further shown by removing the zinc plate from the solution, after the cell has ceased to act, and substituting, therefor, another copper plate. On joining the two copper plates together, it will be found that a current flows from the hydrogen-coated copper plate to the other one until the hydrogen has been dissipated, and this current will be opposite in direction to the former current, indicating that it was to this counter-electromotive force that the former inaction of the cell was due.

To prevent the hydrogen from accumulating on the negative plate of a cell, thereby to prevent polarization, many plans have been devised. When polarization is entirely prevented, "constant" cells are the result; when the deposit of hydrogen on the negative plate is only partially prevented, the cells are liable to be completely polarized if "short-circuited" for a time.

In many open circuit cells, however, substances are employed in connection with or adjacent to the negative plate which tend to absorb the hydrogen as it is set free during the operation of the cell, and that, while the battery is inactive or open, continue to absorb, or combine with, the hydrogen on the negative plate, so that after such cells have rested for a time they become entirely depolarized; the substances used for that purpose being termed depolarizing agents. The manner in which polarization is prevented in "constant" cells will be referred to in the course of the description of the gravity and other cells. *(To be continued.)*

QUESTIONS IN TELEGRAPHY.

What is meant by polarization? Explain the cause of it.

What is the effect of the accumulation of hydrogen gas upon the negative, or copper plate of a battery?

How can it be determined that the accumulation of hydrogen gas upon the copper element of a battery causes the current to fall off?

What means are adopted to prevent the accumulation of hydrogen on the plate?

What are the elements of a gravity cell of battery?

What is the chemical name for the "bluestone" used in batteries?

Into what solutions are placed the copper and zinc elements of a battery?

Radio Telegraphy.

CURRENTS AND MAGNETIC FIELDS OF FORCE.

If a wire connects a charged body with an uncharged or oppositely charged one, the static charge will flow through the wire from the charged to the uncharged body, or from the positively charged body to the negatively charged one, and become a current while so flowing, that is, a current is a moving charge or succession of charges. If the same charge is continuously renewed we have a steady or direct current, often abbreviated as D. C. If the charges are continuously varying in intensity and sign and the variations are periodic in character, we have an alternating current, or A. C.

While the current is flowing in the wire we find that there exists around it a field of force of another kind. If a horizontal magnetic needle is brought near the vertical wire in which a direct current is flowing, the needle will be deflected and the direction in which it will point depends upon the direction in which the current is flowing. This action shows that forces exist in the adjacent space, and the wire carrying the current is said to have a magnetic field about it. The lines of magnetic force may be mapped out with iron filings or a magnetic compass. Thus, if the compass is moved in the direction indicated by the deflection of its needle it will trace out circles around the wire as a center and in planes perpendicular to it.

Thus, in Fig. 4 is shown a section of a wire, perpendicular to the paper and carrying a current downward through it, surrounded by circles, which by the direction of the arrows indicate the direction of the magnetic field at any point, and by the number of lines in any area indicate the intensity of the magnetic field in that area. If the direction of the current in the wire were reversed so as to flow up through the paper, the direction of the arrows would have to be reversed. Similarly, in Fig. 5 the wire is shown lying on the paper and the current flowing toward the top of the page, with the magnetic lines (appearing as dots) going down through the paper on the right of the wire and coming up through on the left.

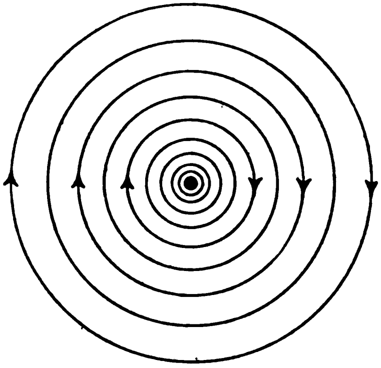

FIG. 4.

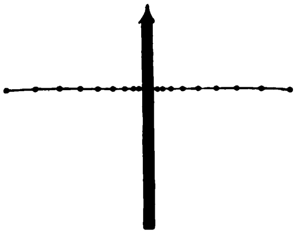

FIG. 5.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

What is current electricity?

What is the difference between static and dynamic electricity.

What is the difference between a direct current and an alternating current?

Are magnetic lines of force a cause or an effect?

If a charged body and an uncharged body, or a body oppositely charged, are connected by a wire, what happens?

Is the current in such a case steady, that is, is it continuous?

What is the meaning of the letters D. C. which are often met with in electrical literature, and what is the meaning of A. C.?

Referring to Fig. 4 how could the magnetic lines of force be reversed?

What are electromagnetic waves as used in radiotelegraphy?

How do electromagnetic waves leave the antenna and impart their energy to the medium, or ether, as it is usually called

Shop Talk.

BY THE OBSERVER.

(Continued from page 82, February 16.)

After all the adjustments suggested have been made a sounder will be found to be inferior to many nearby. Right here we get another good lesson. Many operators not finding a sounder loud enough open wider the space between the upper and lower stops, and by so doing make matters worse. It is indeed annoying to read the Morse characters off a sounder unless it has a good strong back stroke. By opening the stops too wide, we lose the proper sound effect, much breaking results and general dissatisfaction and delays follow. Therefore adjust your sounders with a reasonable play for loudness and good results. If there was a particular distance, or play, that would suit every sounder I should be glad to mention it, but there is not.

The human voice with its articulation and enunciation varies, so does the sound emanating from a telegraph sounder. Hence, follow the suggestions stated and your eye and ear will inform you the proper space to give the armature of every sounder in which to travel for the best results.

We will suppose that all of this has been done and still the sounder is not working well. Be sure that the small screws underneath the sounder base are tight, for it is well known that when these screws work loose the sound is "mushy." If there is still a defect measure the current and see that it comes up to the specifications.

If everything proves O. K. except the sounder, then try another sounder. If that effects the cure then the fault is due to one or several causes within the sounder proper and it would be best to use such apparatus on the sending side of a repeating table, where loud sounders are not required. Never junk such machinery simply because you are unable to effect a complete cure, but, of course, do not place it on "the floor" for an operator to worry with. The defect may be in the sounding board, or the metal, and can only be remedied by a recast or new base board. The company does not expect you to perform large repairs, but it does expect that proper regard be given for its property; therefore always try to find a place for everything and keep everything in its place.

(To be continued)

Mr. Edward Lind Morse, son of Professor S. F. B. Morse, has this to say regarding the annual report of the Old Time Telegraphers and Historical Association: "I was very much pleased with the annual report especially with the reproduction of my father's photograph."

MR. JEFF W. HAYES' DEPARTEMNT.

The Pleiades Club.

CHAPTER VIII.

As the planet Mars has more than 600 days to its year, and as time is of no moment in that delightful abode, Washington's birthday could be celebrated anytime convenient to the members of the Pleiades Club and accordingly the telegraph tournament was scheduled to come off when all preparations were completed.

Such bustling, hurrying and skurrying was seldom witnessed on earth and the telegraph man was in evidence everywhere. Visitors were apprised of what was in store and even the laity took a great interest in what was about to transpire. In addition to talent from the United States and Canada, there were applications from foreign countries of operators who had been noted in their profession in their respective lands.

The unanimous choice of a president was Fred Catlin, of New York, who demurred a little as he hoped to be a participant or judge, but finally acquiesced, and was duly installed as president.

The committee of arrangements was composed of the following well known gentlemen:

R. H. Rochester, A. S. Brown, Dave McAneeny, J. H. Dwight, John Brant, Court Cunningham, Marion H. Kerner and D. Harmon.

The judges were composed of the following:

Madison Buell, G. W. Gardanier, W. B. Somerville, Belvidere Brooks, C. H. Summers, E. C. Cockey and J. C. Hinchman.

The usual exponents of "bug" and hand sending were present to demonstrate the advantages of their respective methods, but there were many present who had never heard of or seen the "bug" and were anxious to see its merits tested.

"I will be on hand with my first typewriter, constructed in 1868, and will undertake to show how I copied the president's message that year," said E. Payson Porter, and the Chicago members of the club applauded loudly.

"Yes, and I will bring my old register with me that I used for so long when I was manager at Akron, Ohio, and show you how I copied so much which never came," remarked ex-manager Allen, formerly of Akron.

"And I will give you an illustration how to read by the 'back stroke,'" said W. H. Kelsey.

"All right, gentlemen," interrupted Fred Catlin, "we will be glad to hear from all, but we have to get down to business and appoint several important committees to carry out this good work."

In addition to the usual programme in such cases, there is also going to be an illustration of "ham" sending, also a demonstration of a beginner at the key.

At this juncture, two young men entered the room, each carrying a typewriter and a Martin vibroplex, similar to those used upon the terrestial planet.

We are going to give a preliminary exhibition of what the youngsters can do with a "bug" and "mill."

To be sure it does not require as much activity or muscle to telegraph now-a-days as it did formerly, when we were compelled to make twelve to eighteen copies with a stylus.

We are now in an entirely different class than we were formerly and the results are greater than they used to be.

The operator of twenty-five years ago was necessarily, in some respects, the superior of the present generation, but he could not possibly turn out the work that is being performed daily and hourly by his latter-day brother with such ease and speed.

While our younger brothers are getting their instruments in order, we will rig up a Morse set and have W. L. Waugh give us an illustration of his beautiful sending while William T. Loper will demonstrate how he used to take fourteen copies of manifold with a stylus in the olden days in St. Louis.

Yes, I used to see Billy Loper do this when I was night chief in St. Louis and he certainly did it well," said Charles J. Lawson, who sauntered in from the rear, when he heard Mr. Loper's name mentioned.

While the audience applauded the expected treat, Messrs. Loper and Waugh squared themselves for the fray.

Like shot poured into a funnel, clicked the dots and dashes, Mr. Loper methodically and with the greatest ease copying the perfect Morse with his favorite stylus on fourteen manifold sheets, in his own beautiful characteristic writing.

For one hour and without a break, the twain worked fast but gracefully, much Phillips' code being used and after counting the hour's work, it was ascertained that two thousand, eight hundred words had been transmitted.

Specimens of the work were distributed among the admiring audience who were loud in their praise of Mr. Loper's copper-plate chirography and the sheets were given out as souvenirs of the occasion.

It was noticeable that after this exhibition, few of the operators from foreign countries enrolled themselves as competitors at the coming tournament.

"Let's give the young fellows a show now," said Fred Catlin, and the two young men previously mentioned, one named Smith, from Birmingham, Postal, and one Brown, from Atlanta, Western Union, came to the front.

The quick, jerky, "bug" sending seemed marvelous to some of the very old-timers and it seemed a little bit difficult for them at first to so adjust their brains to keep up with the merry jingle. The receiving operator, also, was doing some marvelous stunts.

While the sender was transmitting at top-notch speed, the Birmingham boy took out a cigarette, which he lighted, and began to puff with as much *sang froid* as though he were in a down-town cafe, never missing a word or even a punctuation mark.

For one hour this great exhibition kept up, at the end of which time one hundred and thirty messages had been transmitted and copied without an error.

"This is splendid work," said the president, "and shows clearly how the 'bug' and 'mill' have it on even the most famous old-timers. It shows plainly how mechanical devices supplant brain material, and after all these are god-sends to the latter day generation of operators."

Everybody interested in the doings of the telegraph were talking of the day's proceedings, commending the great work of the old-timers and marvelling at the speed and accuracy of the "up-to-the-minute" telegrapher.

Many new applications were received from those anxious to partake in the coming tournament, and files of back copies of the TELEGRAPH AND TELEPHONE AGE were looked over and read with the idea to conform with the usual modus of procedure on such occasions.

Everybody was on the *qui vive,* but all was harmony and a feeling of brotherly love pervaded the inhabitants of this joyous planet.

More particulars concerning the tournament and the results will be reserved for a future number.

William Dee, Superintendent Government Telegraphs, Victoria, B. C.

An old friend and brother brass-pounder of Victoria, B. C., usually has a good story or two to tell when we meet and his latest runs somewhat as follows, which we give in his own words:

"One of our linemen, a fine bright young fellow, now serving his country at the front 'somewhere in France,' D. H. Soule by name, had just come in from a 'hike' over his section gunning for trouble one bright day in midsummer, and as usual was making his entry in the log in his lonely cabin, by the shores of the Straits of Georgia, on the south end of Vancouver Island, locally known as 'The West Coast,' when he heard a big row outside, and, looking up, saw a large panther chasing his pet cat towards the hut. So close were these two that before 'Dave' could jump for his 30-30 the cat dived under the house and the panther, unable to stop himself in his mad rush, slid in through the open door on his haunches, and brought up with a bang against the table leg. Unable to reach anything more substantial, Dave grabbed his log, slammed it shut, and batted the panther over the head, hollering his head off at the beast in the meanwhile. The big cat, bewildered at this sudden turning of the tables, beat it wildly for the open door and so on into the deep brush, with Dave in close pursuit, armed with his trusty rifle. Taking a quick sight, he killed the panther just as it leaped for the top of a log, thus earning the bounty which the fatherly province dispenses for this class of game, and so ending what might easily have proved a nasty incident in a lonely life of a trouble shooter in the wilds of that 'outpost of Empire.'"

Atlanta, Ga., Western Union Staff.

One of the largest and best-manned offices in the country is that at Atlanta, Ga., and life in that city for telegraph men is pleasant. The force is a very large one and the organization is excellent. The operating staff is headed by R. E. Satterwhite, chief operator; W. C. Hair is night chief; J. T. Goodrum and H. E. Stokes, assistant chiefs; A. N. David, H. O. Derby, M. L. Johnson, P. G. Fonville, H. O. Turner, H. B. Smith, A. S. Jackson, W. C. Nelson, J. R. Chaffin and J. A. Hood, supervisors; W. B. Herbig and H. I. Powell, operators and supervisors; J. A. Walker, late night chief operator. Board and repeater men: W. O. Ballard, A. H. Condra, W. A. Reynolds, A. E. Boling, E. Waldron, J. L. Walling, R. Jones, A. W. Carter, E. E. Cunningham, H. C. Foster, L. S. Hooten, F. W. Longmire, T. E. Argo, Hoyt Fincher.

The limitation of space at our disposal precludes giving the names of the operating staff, which numbers 126. There are thirty-four clerks.

Dallas Postal Telegraph-Cable Company of Texas.

Mr. W. E. Griffitts, manager of the Dallas, Tex., office of the Postal Telegraph-Cable Company of Texas, has a staff of employes that, for loyalty and efficiency, is not surpassed anywhere. They all take pride in the company and in their work. Mr. Griffitts is assisted by F. J. Farrell, Jr. J. M. Jefferson is night manager; A. G. Sutton, cashier; J. P. Crane, assistant cashier; S. S. Scothorn, chief operator; W. A. Simms, assistant chief operator; J. N. Lister, night chief operator; E. Goss, Commercial News Department; J. S. Coyle, Jr., chief clerk; C. Darnell, day clerk; C. B. Wiggins, night clerk. There are thirty-one operators and check boys. The company has six branch offices in the city.

Victoria, B. C., Great North Western Notes.

We met the following ladies and gentlemen in Victoria, B. C., many of whose names are familiar to the telegraphic fraternity all over the country: F. H. Blashfield, manager; Annie Sherburn, cashier; Mrs. P. L. Burgess, counter telephone clerk; F. A. Ast, day delivery clerk; Walter Spry, night delivery clerk; C. L. Sheats, chief operator; H. B. Surles, night operator.

H. B. Surles, of the Victoria office, has recently recovered from a protracted illness lasting more than eighteen months. Mr. Surles is son-in-law of Mr. Dunsmuir, the well-known capitalist, but, like a true American born in the South, he scorns assistance from relatives, feeling that he has the ability to carve out his fortune in this way off neck of the woods.

Vancouver, B. C., Great North Western Notes.

The following is a list of names of employes in the Vancouver Great North Western office:

Commercial department—C. H. Daniels, manager; J. Newton, chief clerk; J. Caulfield, solicitor; G. W. Mathews and Miss B. Grossman, branch managers; N. Duns, night manager.

Traffic department—F. H. Morris, chief operator; J. Carter, night chief operator; A. Clament, C. H. Burr and G. C. Duns, operators; Irene Thompson, Irene Gamble and Elsie Robinson, telephone operators.

British Columbia District Telegraph and Delivery Co.—G. Kilpin, chief clerk; G. Blackmun and A. N. Miller, linemen.

Miss Bessie Hogan, who has long been connected with this office as cashier, is convalescing from a serious illness.

Vancouver. B. C., Canadian Pacific.

Miss Lillian McDaniels, an accomplished operator of Nova Scotia, is working for this company in this city, where her presence is very much enjoyed by her co-laborers.

Joel Weaver Baker, erstwhile politician, whilom legislator and quondam electrician, is chief operator. All the boys are happy to have a position under Joel's supervision.

Miss L. H. Hall, who is a very fine operator, is with this company, where she has been for the past six or seven years.

Z. T. O'Connor, known all over the country as "Tom," is one of the stars of the Vancouver office.

J. W. McKinnon, a well-known operator in the United States and brother of Broderick McKinnon of the brokerage firm of Thompson and McKinnon of Chicago, is working in this office.

C. Christian, well-known in Oregon and California, is with the *Province* in Vancouver, B. C.

J. J. Schetgen, recently of Calgary, is wire chief.

James C. Gill, well-known as an Associated Press operator in Chicago, New York and San Francisco, and particularly in the Northwest, is a very successful railroad promoter and makes his residence in this city.

There is on the Vancouver force a disciple of Spencerian penmanship who is noted from Chicago to the Gulf and from St. Paul to the Pacific Ocean. His copy is a picture and is the admiration of all of his colleagues wherever he goes. In addition to being without an equal with his pen he is a thoroughbred high-class gentleman and his name is Roscoe F. Pollard.

We are indebted to Thomas P. Masters of the Canadian Pacific Railway Company's Telegraphs, Vancouver, B. C., for many courtesies extended during a recent visit to his section of the Dominion.

C. Harry Davey, one of the real old timers in the Dominion of Canada, is with the *Victoria Colonist* in Victoria, B. C.

LETTERS FROM OUR AGENTS.

New York Postal.

The following changes have been made recently in city branch offices; On January 1, Manager P. A. Hickey assumed charge of the offices at 153 West Forty-second Street, 1397 Broadway, Hotel Astor and the Hotel Knickerbocker. Manager W. A. Scrivens was advanced from the 944 Broadway office to succeed Manager Hickey at 49 West Thirtieth Street. Manager J. J. Alcock has been advanced from 853 Broadway to 944 Broadway and Manager W. Finley from 703 Broadway to 853 Broadway. J. Sheffery, formerly chief operator at the Forty-second Street and Fifth Avenue office was assigned as manager to succeed Mr. Finley at 703 Broadway. T. V. Rahtes was transferred from 147 East Twenty-third Street to Forty-second Street and Fifth Avenue as chief operator and Walter Redlefson, formerly manager at 1906 Broadway and recently doing border duty with Company A, First Battalion Signal Corps, was assigned as manager of the 147 East Twenty-third Street office. George McLaughlin's assignment as manager of the 1906 Broadway office has been made permanent. These changes are in line with the policy of the company to advance those in the ranks whenever the opportunity presents itself.

Marcus Klepper who resigned from the managership of the 153 West Forty-second Street office on January 1 to become a member of the firm of Klepper Bros., wholesale cloak and suit dealers, is doing very well in his new line. Mr. Klepper joined the forces of this company as messenger eleven years ago and rose through the various positions to that of manager of one of its important branches. He carries with him the best wishes of his old associates.

"BY" office has recently been moved from 853 Broadway to No. 23 Union Square. The new office is fitted up with the most modern equipment and the change of location is right in line with the trend of business in that neighborhood.

Arrangements have been completed to establish a new office at No. 20 West Forty-fifth Street. This section of the city is rapidly changing from a residential to a business territory and the new office, which will have all the latest facilities, will undoubtedly be of great convenience to the telegraph patrons.

In order to meet the requirements of the increasing business of the Fourth Avenue, Madison Avenue and Twenty-eighth Street territory a large store has been rented at No. 75 Madison Avenue to take the place of the office now at 416 Fourth Avenue. The new office will be fitted in modern style and opened for business about March 1. Manager H. J. Reinhardt is in charge of this office.

Corporal Walter Schrieber who recently returned from border duty with company A, First Battalion, Signal Corps. has been appointed manager of the office in the Pennsylvania R. R. station and Raymond Grant who was with him at the border has been appointed to assist him.

W. H. Michener, manager of the Fulton Market office of this company, broke one of his legs recently and is now in the hospital.

New York Western Union.

S. B. Haig, division traffic superintendent, was in Washington last week looking after the unprecedented file of business occasioned by the strained diplomatic situation.

J. V. Riddick of the Marine Department is the representative of TELEGRAPH AND TELEPHONE AGE, covering the 24 Walker Street office. Mr. Riddick is prepared to fill all orders on the shortest possible notice and we would advise those wishing anything that this publication can supply to get in communication with him. He gives each order his personal attention.

H. A. Toland, operator, Commercial News Department, has returned from Kingston, Ont., where he was married on February 10 to Miss Elenor Pritchard of that city.

A multiplex equipment is being installed between Buffalo and Pittsburgh. Division Traffic Inspector J. R. Palmer of New York is stationed at Buffalo in charge of the installation, and Division Traffic Inspector R. F. Drehner is at the Pittsburgh end.

Seth S. Barrett, aged fifty-nine years, for forty-five years an employe of the plant department of this company, died at his home in White Plains, N. Y., February 16.

Our sympathies are extended to Wm. Rock, operator in this office, on the loss of his wife, who died February 20.

A. H. Vanlandingham, operator of this office, died suddenly February 20. A peculiar phase of Van's character known to many of his friends was that he would not work on his own birthday. Lincoln's or Washington's birthdays or any other holidays of the year, he was satisfied to work, but when it came to his own birthday he always asked to be excused.

I. Crook, operator, has been promoted to night marine operator, vice F. T. Dunn, assigned to other duties.

Boston Western Union.

The Educational Society held its annual banquet, and dance February 15 at Shepard's Colonial Restaurant. It was considered the most successful event of the season, over 200 guests being present. The entertainment committee in charge consisted of W. M. Isles, chairman, Miss M. Sullivan, Miss M. E. Smith, Miss J. Sutcliffe, H. E. Stickney, A. B. Kurtz, E. W. Smullen and J. P. Duggins. Vocal and instrumental music was furnished throughout the banquet hour and favors were distributed to all participating. After the banquet there was dancing until midnight. Among those present were district plant superintendent W. S. Barker, plant chief G. H. Bell, district traffic supervisor W. G. Wetmore, chief operator Rex and wife, assistant chief operator Stevenson, Mrs. Stevenson and daughter Ethel, Geo. T. Dee, wire chief. The society, which has been in existence less than a year, has a membership of over three hundred. The next regular meeting will be Thursday, March 1. A paper on a subject interesting to the telegraph profession will be read, followed by entertainment and a dance.

Philadelphia Postal.

The Dot and Dash Club, composed of Philadelphia commercial, railroad and broker telegraphers, will hold its annual meeting in March, for the transaction of business and the election of officers for the coming year.

Four-fifths of all Philadelphia main office operators had perfect records for accuracy during January.

Business continues brisk and every department is hustling.

Wm. R. Brown is a new arrival in the operating room.

Philadelphia Postal telegraphers recently have been doing their turn at "jury duty." Jacob H. Lieberman of the first Chicago circuit has been drawn for March jury duty.

The Philadelphia end of a transcontinental telegraph circuit, connecting all the branch houses of one of the large automobile manufacturers, was handled by Martin J. Bessemer on Washington's Birthday.

W. M. Fitzgerald, city foreman, has returned to duty after a serious attack of the grippe.

John Maguire, all-night chief operator of the Philadelphia Reading and Pottsville Telegraph Co., was a recent visitor.

Philadelphia Western Union.

The second minstrel show and dance of the winter under the auspices of the Western Union Educational Society of Philadelphia was held in Moose Auditorium, February 17. "Plantation Memories," a one-act comedy by Hal Swan, brought forth applause from more than one thousand employes of the Western Union of Philadelphia. A dance followed the show. Those that appeared in the cast are all employes of the Philadelphia main office. Assistant chief operator M. G. Moyer is president, Miss Selma Snyder, first vice-president, and J. T. McCoy, secretary and treasurer. Music was furnished by the Western Union Orchestra, H. C. Pearson, conductor; Louis Stefan, violin; John Ruland, violin, J. E. Watts, cornet; Frank Rasco, cornet; Robert McKee, trombone; Frank Greenstein, piano; Abe Kramer, drums; Wm. Hagen, bass.

Washington, D. C., Western Union.

This company will occupy new quarters in a new building to be erected on G street, corner of Fourteenth street. It has outgrown its present quarters at the corner of F street and Fourteenth.

Chicago Western Union.

The Chicago Telegraphers' Aid Society held its annual "Informal" dancing party at the Logan Square Auditorium on the evening of February 16. It was well attended and an enjoyable time was had. The officers of the association are C. A. Dortmund, president; R. Haiges, vice-president; A. J. Fuller, secretary and R. S. Gill, treasurer.

Seattle, Wash., Western Union.

E. R. Wakefield, formerly in charge of the automatics in this office, has gone to Denver, Col., as division supervisor of equipment with headquarters at that point.

Denver, Col., Western Union.

The Denver Morse department is moving along in good shape under the able supervision of Messrs. Benbow, Ruchford and Work, the latter recently transferred from the automatic department, Messrs. Brown and Vaughn doing the noon relief and extra as supervisors in this department. At night we have Messrs. Ganley and Adams.

L. Lyon, formerly night wire chief, is now night chief operator at Denver. C. A. Griffin, formerly late night chief operator, is now night wire chief. J. E. Moore, former assistant night wire chief relieves Mr. Griffin, and Mr. Doyle of the day repeater force, took Mr. Moore's place.

Our social and educational societies have been very much inactive of late but with the new "E. M. F." officers and Mrs. Ryan at the head of the ladies society, we hope to hear from them soon.

H. A. Smith, until recently late night multiplex plant man, at Denver, has been transferred to Omaha, Neb., where he has full charge of the multiplex plant.

R. C. Prout was recently given the title of assistant chief operator, and placed in full charge of the multiplex, days.

Winnipeg, Man., Great North Western.

Miss C. A. Ptolemy, who comes from Victoria, B. C., has been appointed manager at Port Arthur, Ont., vice Mrs. L. Carter transferred to the operating room at Winnipeg. Miss Ptolemy is a niece of William J. Ptolemy, deputy provincial treasurer of Manitoba.

A "Get Together and Get the Business" Club was formed at Winnipeg January 30, of the heads of departments and their assistants. District Superintendent J. G. Davies presided and explained the purpose of the club, which will be of an educational nature. It was decided to hold meetings once a month. The meetings will be commenced with a dinner at one of the local hotels after which there will be a general discussion of matters pertaining to the service for one hour. After this the main subject of the meeting will receive attention. Papers covering a certain subject will be read and discussed.

The Great North Western Telegraph staff at Winnipeg defeated the Canadian Pacific Railway staff at a curling match on January 26. The Canadian Pacific Railway having challenged the Great North Western, Superintendent Davies, although having only recently arrived in the land of ice and snow, lined up a team which defeated the challengers by a score of 7 to 5. The following members participated:

Great North Western—J. G. Davies, H. Saults, F. W. Lee, G. Wainwright. Canadian Pacific Railway—J. R. Russell, J. H. Kennedy, H. A. MacRae, F. Gray.

Essentials of Electricity.

An excellent book for students of electricity is "Essentials of Electricity," a text book for wiremen and the electrical trades, by W. H. Timbie, head of the department of applied science, Wentworth Institute, Boston, Mass. The book touches briefly on the principles of the telegraph and the telephone, but its general character covers every use of electricity, and for that reason is particularly valuable to the student and the practical man. A student of telegraph or telephone engineering should not confine himself to the telegraph or the telephone alone; it is very important to know, in a general way, at least, how electricity is applied in other branches. This book tells all this, and has the special advantage of being a very practical education through the many problems found throughout the volume, as study progresses. The answers to the problems are contained in a pamphlet separate from the book. The contents of the book cover Ohm's law; simple electric circuits; combinations of series and parallel systems; electric power; wire and wiring systems; generators and motors; locating and correcting trouble; batteries; wiring diagrams, etc.

This is a real practical work and is worth having and studying. It contains 271 pages and 222 illustrations and measures 5 by 7 inches, which is a suitable size to slip into the pocket.

The price of the book is $1.25 per copy, and of the pamphlet containing the answers 25 cents extra, $1.50 in all. Copies may be obtained of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

THE TELEGRAPH AND TELEPHONE LIFE INSURANCE ASSOCIATION has levied assessments 616 and 617 to meet the claims arising from the deaths of J. Maloney at New Orleans, La.; C. W. Lemont, Brighton, Mass.; Grace Catlin, Chicago, Ill.; G. H. Usher, Atlanta, Ga.; R. R. Zeigler, Philadelphia, Pa.; E. A. Beardslee, Los Angeles, Cal.; Jennie Hodge, Oakland, Cal.; R. W. Bender, Washington, D. C.; J. W. Schmults, Hackensack, N. J.; F. A. Wood, Montclair, N. J.; F. J. Callahan, Long Island City, N. Y.

P. V. Mehen, of Grand Rapids, Mich., writes: "Herewith post office money order for renewal for 1917. The high cost of living does not seem to affect the excellent standard of our old friend, the AGE."

32d YEAR

Serial Building Loan and Savings Institution

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Vice-President, Thomas M. Brennan
Secretary, - - - Edwin F. Howell

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Surplus - - - - 40,000

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Western Union Building, 16 Dey Street, 9 a. m. to 5 p. m.
Postal Building, 253 Broadway, Room 1030, 2.30 to 4.30 p.m., Fridays, and each 15th and last day of month.
Telephone Building, 24 Walker Street, Room 1129, Daily 9 a. m. to 2 p. m.
Saturdays 1 p. m.

Rubber Telegraph Key Knobs.

No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. Address orders to TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York.

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BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, MARCH 16, 1917.

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Features of Our Educational Department.

We have made arrangements to publish a series of distinctive articles on telephone operation in the Educational Department of this journal, which should be appreciated by our telephone and telegraph readers. The first of the series begins in this number, and covers the magneto system which is in general use in smaller places. The articles are elementary and are so clearly written by experts that any one can understand them.

In addition to the telephone articles, the telegraph and wireless are covered in a like manner, and our student readers will find in all an excellent means of advancing their knowledge on all three subjects. The articles are authoritative and reliable and will form a valuable feature of this journal.

Wireless Development by the Navy Department.

It is a matter of great pride to many Americans to know that the navy department officials are doing so much effective work with wireless telegraphy, in bringing the ships and headquarters at Washington together as one family, no matter what part of the world the vessels may be in.

The development of wireless by the navy department has for its main object communication with any American war vessel in the Atlantic and Pacific Oceans, from Washington, and will no doubt be of inestimable value in promoting the efficiency of the naval service.

The government has and is erecting wireless plants at various points along the Atlantic and Pacific coasts which will cover the two great oceans, and is now working on stations at Pearl Harbor, Hawaii, and Cavite, in the Philippines. It has just opened a station at Chollas Heights, near San Diego, Cal., which station is now in regular communication with the Arlington, Va., plant and through it with the navy department at Washington, and when the chain of stations is complete no vessel of our navy will be able to get beyond talking distance with Washington.

The development of wireless is one of the modern wonders and what can be further done with it and by it time alone will reveal.

Operators are Less Migratory.

Great changes in the social habits of operators have taken place in recent years and they are more content to settle down in one place and remain there. They are not so migratory as were operators of the earlier generations.

Operators usually are developed in the town of their birth, but up to late years when a young fellow got to the point in his experience where he thought his work ought to yield him more money he usually cut loose from his early associations and tried his fortune elsewhere. In such cases as a rule the change meant more money.

The desire to see the world was another powerful influence among young men, but the salary question was the all-important one. An operator made up his mind to earn more, and all tradition supported the belief that he could not get any more money if he stayed home the rest of his life, so he struck out on an independent basis.

The old idea, however, is rapidly passing away. Under the modern methods of conducting a telegraph business a man is paid for what he is worth to the company, wherever he is, and he knows that if he left home to go somewhere else he could not do any better so he is likely to remain and enjoy home comforts.

In many of the larger offices throughout the country there are operators who were born in the place in which they are working and have never worked anywhere else. The number who favor this mode of living and working is decidedly on the increase.

They are more contented at home because they know they are doing as well as they could anywhere else, and getting the best possible living from their salaries. Such a state of affairs is far better for the men themselves and for the company they work for. The men are happier at home, especially if they have families, and the company derives the benefit that naturally results from having a force of contented, faithful and steady employes.

Telegraph and Telephone Patents.

ISSUED FEBRUARY 6.

1,215,002. Telephone Apparatus. To E. A. Cox, Dayton, Ohio.

1,215,038. Telephone Circuit Arrangements. To C. D. Manning, Boston, and S. C. Drew, Brookline, Mass.

1,215,060. Telephone Head-Gear. To T. Rhodus, Chicago, Ill.

ISSUED FEBRUARY 13.

1,215,331. Telephone Toll System. To H. M. Bascom, Brooklyn, N. Y.

1,215,348. Telephone and Telegraph Relay or Repeater. To J. H. Cuntz, Hoboken, N. J.

1,215,377. Sanitary Telephone Mouthpiece. To E. M. Jenkins, Italy, Tex.

1,215,378. Telephone Exchange System. To L. H. Johnson, Bloomfield, N. J.

1,215,487. Telephone System. To H. P. Clausen, Mount Vernon, N. Y.

1,215,515. Non-Interference Successive Signal Box. To R. J. Gaskill, Fort Wayne, Ind.

1,215,604. Automatic Printer. To G. M. Yorke, New York.

1,215,605. Means of Synchronizing Rotary Devices. To G. M. Yorke, New York.

1,215,702. Loading Duplex or Multiplex Telephone Lines. To H. B. M. Pleijel and A. H. Olsson, Stockholm, Sweden.

1,215,734. Telegraph Call. To C. Spiro, New York.

1,215,814. Switch for Automatic Telephone Systems. To W. Kaisling, Chicago, Ill.

ISSUED FEBRUARY 20.

1,216,305. Automatic Telephone System. To C. L. Goodrum, New York.

1,216,323. Telephone-Subscriber's Calling Mechanism. To A. E. Keith, Hinsdale, Ill.

1,216,365. Automatic Telephone System. To C. E. Rogers, Oakland, Cal.

1,216,461. Telephone Ring-Back or Reverting-Call System. To G. E. Kimball, Rochester, Pa.

1,216,480. Telephone. To Katherine Nichols, Cincinnati, Ohio.

1,216,533. Electrical Telegraph and Indicator System. To F. W. Wood, Brooklyn, N. Y.

1,216,534. Automatic Telephone System. To G. A. Yanochowski, Chicago, Ill.

1,216,641. Automatic Telephone System. To C. S. Winston, Chicago, Ill.

1,216,720. Wireless Telegraph Transmitter of the Portable Type. To M. A. Mulrony, Randwick, near Sydney, New South Wales, Australia.

1,216,776. Telephone Attachment. To J. J. Convery, New York.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on March 10:

American Tel. and Tel. Co.	127½
Mackay Companies (ex div.)	86-88¼
Mackay Companies, pfd. (ex div.)	64-67
Marconi Wireless Tel. Co. of Am. (Par value 5.00)	2⅝
Western Union	94¾

DIVIDEND.—The Mackay Companies have declared a quarterly dividend of 1½ per cent. on the common stock and 1 per cent. on the preferred, payable April 2.

PERSONAL.

MR. E. C. BRADLEY, director, and former vice-president of the Pacific Telephone and Telegraph Company, San Francisco, Cal., has been appointed assistant to the Secretary of the Interior, Washington, D. C. Mr. Bradley was vice-president of the Postal Telegraph-Cable Company, New York, for ten years previous to his entering the telephone service at San Francisco in 1907.

MR. E. E. BRUCKNER, of Chicago, a prominent telegrapher of the West, who revised the Phillips Code and brought it up to date, has been awarded a degree in law by the University of Chicago. He has also passed the examination for the practice of law before the Illinois bar.

MISS ISABELLE VIRGINIA FREELAND, of Lakewood, Ohio, a member of the well known family of Freelands, old time telegraphers, is the author of an interesting story for young people entitled "In the Land of Fairies," and published in a recent issue of the Cleveland *Plain Dealer*.

MR. W. E. HEADY, secretary of the New York State Industrial Commission, with headquarters at New York, is a former telegrapher. He worked on various railroads in the West, the northwest and on the Pacific Coast. He was employed by the Western Union Telegraph Company in New York and San Francisco, also by the Postal Telegraph-Cable Company in San Francisco, and besides being a telegrapher he is a stenographer.

TELEGRAPH PEOPLE IN FLORIDA.—A number of former telegraph officials sojourn in various parts of Florida during the months of January, February and March. Among those located at Pass-a-Grille, Fla., are Wm. H. Baker and wife; C. H. Bristol, wife and daughter, New York, and I. N. Miller of Cincinnati. According to reports the latter gentleman is a great fisherman and only the gamiest fish and the most difficult to land satisfies him.

MRS. T. A. EDISON.—It is seldom that the general public hears of the wife of Mr. T. A. Edison. Her husband seems to get all the publicity, but Mrs. Edison is entitled to a great deal of praise and honor for the work done in her line of activity. She is a leader among women as well as in social and charitable work in West Orange, where the Edisons reside, as well as the adjoining cities and she is a generous contributor to and supporter of every movement that tends to the amelioration of suffering and want among the people. Mrs. Edison is a very noble and able woman and has a host of friends who are delighted to be associated with her in her uplifting work. She is very active in church work of every kind and does a great deal of good. She is a splendid companion of her famous husband.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. Edward Reynolds, vice-president and general manager, is planning a trip to the Pacific Coast. He will leave New York toward the end of March.

Trustees of Mackay Companies.—At the annual meeting of The Mackay Companies, held in Boston on February 15, the following trustees were elected: Clarence H. Mackay, William W. Cook, George G. Ward, Edward C. Platt, George Clapperton, M. W. Blackmar, The Rt. Hon. Lord Shaughnessy, K. C. V. O. (president of the Canadian Pacific Railway Company); Sir Vincent Meredith, Bart. (president of the Bank of Montreal); Sir Edmund B. Osler, K. B., of Toronto, and Sir Thomas Skinner, Bart., of London, England.

Mr. W. I. Capen, vice-president, New York, and Mrs. Capen, have returned from their holiday, spent in Havana. They passed a few days in Florida on the way to New York.

Mr. G. W. Ribble, general superintendent, Atlanta, Ga., recently made business trips through various states in his division.

Mr. E. Kimmey, district superintendent, New York, has gone to Boston as superintendent of the fourth district, Eastern Division, and Mr. C. A. Richardson, former superintendent of that district, has been brought to New York as superintendent of the second district, in Mr. Kimmey's place.

The New Tariff Book just issued by this company is gotten up in an excellent manner. It contains 386 pages of type matter and six pages of maps of cable and land lines of the world. Different sections of the book are printed on paper of distinctive color; the money transfer service, for instance, is on green paper; instructions in handling cablegrams on pink paper, and the book of rules on yellow paper. On the front cover is a list of principal cities in the world showing the difference in time compared with that of New York. The volume is well printed and bears every evidence of much care in its preparation. It reflects much credit upon the work of Mr. Isaac Smith, superintendent of tariffs.

Mr. Henry Scrivens, superintendent, Pittsburgh, Pa., has made arrangements to move the Sharon, Pa., office of this company into larger quarters about April 1. Mr. W. W. Powell, of the Erie, Pa., office, has been appointed manager at Sharon.

Mr. J. F. Heard, division electrical engineer, Atlanta, Ga., has been engaged on plans for the new office at Memphis, Tenn., and the remodeling of the Augusta, Ga., office and work of a similar character at other places in the Southern Division.

Mr. C. F. Crittenden has been appointed manager at Detroit, Mich., vice L. C. McCormick. Mr. Crittenden was formerly manager at Oklahoma City, Okla.

The Altoona, Pa., office of this company has recently been thoroughly overhauled and brought up to date.

New Offices will be opened by this company at Rutland, Vt., on April 1 and Poughkeepsie, N. Y., May 1.

Managers Appointed.—C. O. Beatty at Salem, Ohio; W. H. Blechinger, Ashland, Ohio; F. W. Thomas, Hornell, N. Y.; G. Dore, Lockport, N. Y.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Mr. J. C. Willever, vice-president in charge of commercial department, New York, is making a business trip through the Western Division.

Messrs. W. N. Fashbaugh, vice-president in charge of traffic, T. W. Carroll, general manager of the Eastern Division, and S. B. Haig, division traffic superintendent, New York, were in Washington, D. C., during the inauguration ceremonies on business connected with the service.

The Annual Meeting of the stockholders of the Western Union Telegraph Company for the election of directors and inspectors of election will be held at 195 Broadway, April 11.

Mr. F. E. d'Humy, central office engineer, New York, left for San Francisco on March 3 on business connected with the service. He will stop at many points en route.

Appointments. — Among the recent appointments made by Mr. C. F. Ames, commercial superintendent at Boston, are Mr. A. N. Saylor, formerly manager at Pittsfield, Mass., manager of the Springfield, Mass., office, vice Mr. C. H. Simpson, granted a six months' leave of absence; Mr. J. J. Glynn, formerly special salesman, manager at Pittsfield, vice Mr. Saylor; Mr. T. F. Kane, formerly of the traffic department, manager at Holyoke, Mass., vice Mrs. A. L. Faulkner.

New Cleveland Office.—The new main office at Cleveland, Ohio, will be occupied on March 24.

New Elmira Office.—A new location for the Elmira, N. Y., office has been secured and the new office will be opened about May 1. Mr. J. J. Brickwedde is manager.

The Hutchinson, Kan., office was made a functional office February 1 with P. P. Hughes, manager; P. R. Lusk, chief operator, and G. A. Hardy, night chief operator.

Bowling Contest.—A unique bowling tournament will be held April 5, when Western Union bowling teams at Denver, Col., Chicago, New York and Atlanta, Ga., will meet by wire to determine the champions of the Western Union Company. The meet will start at 8:30 p. m. eastern time. A wire will be set up from Atlanta to Denver via New York and Chicago. Loops will be run to the alleys in each city where instruments will be installed. Results will be sent by each city at the end of each frame, a feat which has never before been attempted. The New York Western Union Bowling Association will hold its annual beefsteak dinner on the evening of April 14. Committees are actively engaged in making preparations to insure a large attendance.

Dishonest Telegraph Employe Brought to Justice.—Some months ago Carl A. Peterson, alias A. C. Carlson, employed as joint agent at Goffs, Kan., on the Missouri-Pacific Railroad, forged a message purporting to be sent by the First National Bank, addressed to the First National Bank at Council Bluffs, Ia., and reading "Pay to F. A. Callahan one hundred fifty dollars. Waive identification." On the strength of this message $150 was paid to the person representing himself as "F. A. Callahan," who called at the First National Bank the following morning.

Following its established practice in such cases, the Western Union Telegraph Company unrelentingly pursued Carlson or Peterson and finally located him at Missouri Valley, Ia., where he was arrested and taken to Council Bluffs. The evidence which the company had painstakingly collected against Peterson was so conclusive that he confessed and pleaded guilty, and we are advised he has just been sentenced to seven years in the state reformatory at Anamosa, Ia.

Test Suit on Exchange of Business.—Judge Mayer in the Federal District Court filed a decision February 19 granting the decree asked for by the Baltimore & Ohio Railroad Company, requiring the Western Union Telegraph Company specifically to perform a contract entered into between them for exchange of railroad for telegraph service on company's business, and restraining the defendant company from violating the provisions of the contract. It was a test suit brought before Judge Mayer because the Interstate Commerce Commission in a ruling made on March 28, 1916, held that the exchange of service between the parties to the contract only applied to "one line" service and not to "off line" service. This is the case referred to in our issue of February 1.

Messrs. W. L. Jacoby, president; F. J. McLain, secretary, and R. M. Hopkins, superintendent of engineering, American District Telegraph Company of New Jersey, have returned from a business trip to Chicago.

Death of C. A. Tinker.

Charles Almerin Tinker, aged seventy-nine, for many years previous to 1902 when he retired from active service as general superintendent of the Eastern Division of this company, New York, died at the home of his daughter in Winnipeg, Man., March 12. Mr. Tinker was one of the best known telegraph officials in the country. He was one of the "sacred three" telegraphers who were so closely associated with President Lincoln during the civil war. The remains will be brought to New York for interment. He is survived by a son and a daughter.

An Interesting Exhibit of Telegraph and Cable Operation.

The Western Union Telegraph Company made a unique and interesting exhibit of the latest telegraph and cable apparatus in operation at Madison Square Garden, New York, March 7 to March 10, inclusive, under the auspices of the Vacation Association.

The exhibit occupied a booth twenty feet long and ten feet wide on the main floor. On one side of the booth there was a cable sending and receiving station laid out in a graphical manner. The cable apparatus included a Kleinschmidt perforator, a transmitter and a recorder and a piece of ocean cable connecting the sending and receiving apparatus. This cable looped around in a small tank filled with sand, shells and water and was surrounded with greens and shrubs.

On the left hand side of the booth was a modern multiplex operating table. The back of the booth contained a small commercial office from which actual business was transacted over a local Morse set. A multiplex equipment was also shown in actual operation, also a "ticker." All the apparatus was demonstrated by attendants.

The booth was decorated with American flags and evergreens which formed a very attractive feature.

THE CABLE.

Mr. John Wilkinson, until recently assistant superintendent of The Commercial Cable Company's station at Waterville, Ireland, has been appointed superintendent of that company's London offices, to succeed Mr. E. G. Phillips deceased. Mr. Wilkinson has been in The Commercial Cable Company's service since October, 1884. He served as operator at the company's Liverpool office until February, 1891, when he was made assistant superintendent of that station. In August, 1911, he was transferred to the company's cable station at Waterville, Ireland, as assistant superintendent. Mr. Wilkinson has acquired considerable experience in the administration of landline and cable offices and besides has a thorough technical knowledge of both landline and cable apparatus.

Mr. John D. Gaines, superintendent of the Commercial Pacific Cable Company at Shanghai, China, who, with Mrs. Gaines, has been on a holiday for some months, left New York on March 8 for his home station. Mr. and Mrs. Gaines visited their former homes in Nova Scotia, Massachusetts and Virginia.

Mr. John W. Lawson, former superintendent at Havana, Cuba, for the Commercial Cable Company, has been appointed superintendent at Rockport, Mass., vice Robert Herne, retired.

Chas. Ashurst and Wm. Condon, identified with the Central and South American Telegraph Company, New York, have been transferred to Iquique, Chile, as cable operators.

Mr. J. C. Bailey, supervisor of the Western Union Cable System at Bay Roberts, N. F., and Mr. E. P. Angel, supervisor of the same interests at North Sydney, N. S., are in New York on business connected with the cable service.

Cables Repaired.—The cable between Guam and Manila, which was interrupted February 21, has been repaired, thus restoring communication with the Philippines and China. The Hong Kong-Manila cable has also been repaired and direct communication with Hong Kong and southern China is reestablished.

A **Multiplex** equipment is being installed between the Central Cable Office, New York, and the Western Union cable station at Hearts Content, N. F. The distance is approximately 1,300 miles and there will be almost 200 miles of cable in the circuit.

Mr. Robert Herne, superintendent of the Commercial Cable Company, at Rockport, Mass., who has just been retired from active service, was born at Limerick, Ireland, September 30, 1852. He joined the telegraph service in his native country, and entered the employ of the Direct United States Cable Co. in 1874. He was stationed at Ballingskelligs, Ireland, and at Rye Beach, N. H. In 1884 he joined the Commercial Cable Company as superintendent at Rockport, Mass., and under his management the Rockport station was always a model of efficiency. Mr. Herne retires because of having reached the age limit, but it is not expected that a man of his vigor will abstain from all activity. His many friends will keep him in view.

E. G. Phillips, aged fifty-five years, superintendent of the Commercial Cable Company, at London, England, died on February 15, after a brief illness. He was born in London on September 29, 1862. He joined the service of the Commercial Cable Company in October, 1884, and served the company continuously at London for over thirty-two years. Mr. Phillips was an expert telegrapher, a very zealous, energetic and loyal employe, and possessed a thorough practical knowledge of the administration of a busy telegraph office. His nature was generous and affable and his death will be deplored by the many friends he made in life.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to March 10, 1917, as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Chee-foo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable), October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917.

Book on Cable Testing and Working.—The third edition of "Beginners' Manual of Submarine Cable Testing and Working," by G. M. Baines, has been issued. The author is a practical cable man and has written the book in as clear a manner as possible for the benefit of beginners and students. The price of the book is $3.50 per copy. For sale by Telegraph and Telephone Age, 253 Broadway, New York.

Looking Backward.

The Charleston, S. C. *News and Courier,* in its issue dated February 13, reprinted from the columns of the same publication dated February 13, 1867, just fifty years previous, the following items which will be of interest to telegraph people:

"OCEAN TELEGRAPH FACILITIES."

"Boston Journal: Cyrus W. Field sailed for Europe Wednesday, on business of the Newfoundland Telegraph Company, to order a submarine cable which is to be laid from Placentia to Sydney, in Cape Breton, or to some point nearer on the coast, where it will meet the Western Union lines, thus saving the risk of the long land lines in Newfoundland. These lines, however, are to be kept up, and as soon as spring opens a line is to be built over the old road, cut through the forests by the Newfoundland Company, ten or twelve years ago. There will then be three perfect lines, which should prevent any failure hereafter in the prompt transmission of news."

"NEW OCEAN TELEGRAPH."

"Our mail advices confirm the intelligence that the Spanish Government has granted to the International Ocean Telegraph Company, of New York, the exclusive privilege for forty years of laying telegraphic cables between the United States and Cuba. It is also announced that the Spanish Government has further agreed to grant to the same company an exclusive privilege for a similar period for connecting by telegraph the island of Porto Rico and Cuba."

CANADIAN NOTES.

Mr. H. Hulatt, manager of telegraphs, Grand Trunk System, Montreal, Que., addressed the Montreal Electrical Association at its weekly luncheon on March 7, on the subject, What will be the position of the inefficient after the war? "It is safe to say," Mr. Hulatt said, "that many of the men who have been to the front, due to the hardships they have gone through, will come back much more resolute in character and with a far greater development of initiative. . . . They will be strong competitors with those at present in employment."

McGraw and Hill Publishing Companies Consolidate.—The McGraw Publishing Company, Inc., and the Hill Publishing Company, New York, have been consolidated as the McGraw-Hill Publishing Company, Inc. The new company acquires all the properties and interests of the two constituents, including the various journals published by them.

Mr. Arthur Lockwood, identified with the Brookfield Glass Company, and a son of Mr. T. D. Lockwood, general patent attorney of the American Telephone and Telegraph Company, writes: "I am enclosing you check in the amount of $2.00, covering 1917 subscription to your paper, which I find not only interesting, but I look forward with pleasure to receiving the paper from time to time."

THE TELEPHONE.

Medal for Dr. Bell.

The Civic Forum will present a medal of honor to Dr. Alexander Graham Bell, as the inventor of the telephone, at a meeting in Carnegie Hall, New York, on the evening of March 21. Addresses will be made by Messrs. Thomas A. Watson, John J. Carty, U. N. Bethell, Admiral Robert E. Peary, and other well known gentlemen.

Annual Report of the Bell System.

The annual report of President Theo. N. Vail presents the operations of the American Telephone and Telegraph Company and associated companies, that is the Bell System as a whole, with inter-company duplications excluded. In round numbers the total operating revenues of the Bell System were $264,600,000, an increase of $30,151,000 or 12.9 per cent. over the year before. Of these revenues depreciation and maintenance consumed $84,556,000, an increase of $8,797,000 or 11.6 per cent.; traffic expenses consumed $53,749,000, an increase of $7,963,000 or 17.4 per cent.; commercial expenses $25,699,000, an increase of $2,116,000 or 9 per cent.; general and miscellaneous expenses $11,902,000, an increase of $853,000 or 7.7 per cent.; taxes assignable to operations $14,916,000, an increase of $1,915,000 or 14.7 per cent.

The "total gross income," using the term officially provided by the Interstate Commerce Commission, was $79,353,000, an increase of $9,787,000 or 14.1 per cent. over 1915. Out of this $22,114,000 was paid for interest, rents, etc., leaving $35,160,000 for dividends and over $22,000,000 to be carried into surplus.

Approximately $6,000,000 was paid to the employes as additional compensation to cover abnormal working conditions and living expenses of the year.

It is stated that it would cost many millions more to replace the physical plants of the Bell System than the amounts at which they stand on the books. The appraisal of 1912 showed that they would exceed the book cost by about $61,000,000, although at that time copper was 17 cents a pound while now it is around 35 cents.

In spite of the scarcity and high cost of material the average investment per station has decreased from $149 to $146 in consequence of the absorption into service of surplus plant. The average revenue per station is about the same as last year and the average expenses have been kept down in spite of increased wages and taxes, by improved methods and greater efficiency in every branch of the service.

The percentage of the associated companies' net earnings to plant and other assets was 6.17, which was somewhat above normal on account of the sudden increase in the demands without a correspondingly sudden increase in plant.

The Employes' Benefit Funds aggregated at the end of the year $9,151,000 and in the last four years the expenditures from these funds have amounted to $5,611,016. Pensions are paid to 284 former employes. Benefits were paid last year in 18,760 cases. There were 10,646 accident cases, of which comparatively few were serious, and the payments on these were $557,979. Death benefits of $157,077 were paid to the dependent relatives of 182 employes.

Employes of the Bell System who were in military service on the Mexican border were allowed full pay for the first three months of their absence and thereafter full pay less the amount they received from the government. These allowances aggregated $284,194.

The statement of the American Telephone and Telegraph Company shows that its expenditures are only for the maintenance of the central administration of the whole Bell System, and that its receipts are from its investments in its associated companies, the payments of these companies towards the maintenance and expenses of the central administration, and the earnings of the long distance lines.

The net earnings of the American Telephone and Telegraph Company for the year were $44,743,-376.45 which is $3,625,889.17 more than for the previous year. The interest charges were $6,730,098.86 and the dividends at the regular rate of 8 per cent. per annum were $31,122,187.46. Of the resulting balance there was carried to reserves $2,500,000 and to surplus $4,391,090.13. To meet the construction requirements of the company and of the associated operating companies and for other purposes the company sold in December $80,000,000 of thirty-year five per cent. collateral trust bonds. Additional financing was provided for by the offer of new stock to the amount of $39,550,600, practically all of which was subscribed for. The capital stock of the company outstanding was $395,603,600 and the number of stockholders (of whom the majority are women) was 70,555. The average number of shares held is fifty-six shares each. In addition there are 43,000 employes of the Bell System who had purchased stock and are paying for it out of their wages.

Important progress in engineering was made during the year, increasing the range of telephone speech transmission many fold. Hundreds of inventions have been studied and tested and attention has been given to almost every one of the plants making up the complex telephone system, with the result that an unusually large number of improvements have been introduced in cable, switchboard, substation and other apparatus, resulting in economies and advances in service of great public value.

During the year important work has been done in co-operation with the officers of the Signal Corps of the Army, in planning for the best way to make use of the plant and organization of the Bell System in case of military necessity. Enough has already been done to make certain that the co-operation and assistance which can be given by the Bell System to the Army whenever necessary will be even more varied and more extensive than that required by the Navy.

Regarding government ownership President Vail says that arguments and promises are being made which have again and again been proved fallacious. There is no reason why any individual or public official should be misled in respect to the telephone business, for there is hardly a district in the United States in which there has not been an opposition company promoted on substantially these same promises and statements. The experience of the northwestern Canadian provinces in government ownership and operation shows that no single promise has been kept or carried out, that there has been less extension than with the private company, that rates have been raised and rural service neglected if not ignored.

In regard to the new building at 195 Broadway, New York, officially known as the Telephone and Telegraph Building, Mr. Vail has this to say: "Although it is in contemplation that the American Telephone and Telegraph Company shall become sole owner of the building, it is still owned jointly with the Western Union. Arrangements, however, are being made for the Western Union to continue its general offices in the building, retaining for that purpose several floors."

A TELEPHONE BOOK WORTH HAVING.—"Electricity and Magnetism in Telephone Maintenance," by G. W. Cummings, is one of the most instructive books for telephone students. It gives a very thorough and correct explanation of electricity and magnetism as related to telephone practice, and when one has read and studied it he feels that he has learned a great deal about the fundamentals of the telephone, and that, easily, because the book is plainly written. It has chapters on current, pressure, resistance, magnetism, electromagnetic induction, capacity, batteries and circuit drawing. This work may be obtained of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York. Price $1.50.

RADIO TELEGRAPHY.

MARCONI NOTES.

COMPLIMENTARY DINNER.—The Washington section of the Institute of Radio Engineers gave a dinner, March 3, at the Commercial Club, Washington, D. C., complimentary to Brigadier General George O. Squier, chairman of the Washington section. The following named gentlemen from New York participated: R. A. Weagant, chief engineer, and David Sarnoff, commercial manager, of the Marconi Wireless Telegraph Co. of America; Major J. Andrew White and W. J. Hernan, of the Wireless Press.

MR. FRANK CHAPMAN, who has been promoted from the managership at Miami, Fla., to be superintendent of the Southern Division, with headquarters at Baltimore, Md., was a recent New York visitor.

THE MARCONI SCHOOL is now full, seventy-five pupils being enrolled for the day and night sessions.

STRONGER WIRELESS COMMUNICATION.—Another record-breaking achievement in the wireless art has been accomplished by the Marconi system in establishing strong, direct and continuous communications over twelve-hour periods between the station of the Marconi Wireless Telegraph Company of America at Chatham, Mass., and that of the English Marconi Company at Carnarvon, Wales. The signals received at Chatham from Carnarvon were from three to eight times as strong as those obtained from any other European station. These tests were successfully carried out on January 29 and 30.

THE INSTITUTE OF RADIO ENGINEERS held its regular monthly meeting on the evening of March 7 in the Engineering Societies Building, New York. Professor Edward W. Washburn of the University of Illinois presented a paper on "The Determination of the Audibility Current on a Telephone Receiver." The paper described a new method of determining this important quantity.

NEW YORK HERALD WIRELESS STATION AGAIN IN COMMISSION.—The wireless station of the *New York Herald* was formally returned to commission on February 28 in its new quarters atop the United States barge office in New York. Mr. John Bottomley, vice-president, secretary and treasurer of the Marconi Wireless Telegraph Company of America, New York, was present at the opening ceremonies. The *Herald* station was placed under censorship last October.

TRANSCONTINENTAL RADIO SERVICE BY AMATEURS.—The American Radio Relay League, an organization of amateur wireless stations in all parts of the United States, is handling wireless messages across the continent. A message was recently sent from New York to Los Angeles, Cal., and an answer received in less than two hours. It was relayed five times. The services of the league have been offered to the government for defense purposes.

San Diego Naval Radio Station.

The radio station built for the United States Navy Department on Chollas Heights, near San Diego, Cal., is now in regular service. On the occasion of sending the first official message to Arlington, Va., (January 26), a silver telegraph key, especially made for this event, was used. The plant is nominally rated at 200 kilowatts, operates on the Poulsen system, and is the most powerful thus far put in service. The aerial is carried by three 600-foot self-supporting steel towers placed in a triangular position.

This is the third plant in the chain of navy high-powered radio stations of which Arlington was the first and Darien the second. Pearl Harbor and Cavite are the next two in the progressive development, and these will have apparatus of much higher power than that installed at San Diego. The arcs for Pearl Harbor and Cavite weigh 65 tons each, and are the largest and most powerful pieces of radio apparatus ever built. All of these stations are being constructed by the Federal Telegraph Company and operated on the Poulsen system. With the completion of this chain it is expected that it will be possible always to maintain communication between war vessels in the Atlantic or Pacific oceans and headquarters at Washington.

MR. C. W. GULICK, well known as a line constructor in years gone by, long since retired and living at White River Junction, Vt., in renewing his subscription for another year a few days ago, wrote: "I am now only a 'has been' but I see the names of old friends in your valuable paper occasionally and that is worth the subscription price of admission."

Opportunity.

BY J. V. RIDDICK, NEW YORK.

"Opportunity knocks at every man's door once during life."

Shakespeare expresses this same idea when he says:

"There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life,
Is bound in shallows and in miseries."

We must not, however, become obsessed with the idea that each person's life has one great turning point, or that a man's whole career hangs on one grand moment of decision; we know from experience such is not the case.

Opportunities present themselves to us every day. Many of them small it is true, individually, but great in the aggregate. Those who wait for opportunities are wasting opportunities, because in waiting for some supreme chance they are overlooking those that have come. It is only by thorough application to the duties of our humble station, we can be prepared to grasp the higher ones later. Do not forget that the present becomes the past. Memory is a blessing, but it becomes a curse if it must look back upon a series of lost opportunities. Do not let opportunities slip. Remember, now is the time—today. Do not wait for tomorrow. Grasp them now, else our accusing angel, memory, will in after years forcibly remind us of wasted opportunities. Then must we watch our sighs and tears of unavailing regrets rising up and up, even as Abraham looking back saw the smoke of Sodom ascending to the heavens.

"Strike while the iron is hot," is good advice, but it must not tempt us to strike before the metal has had time to get heated. Neither should we allow the iron to become overheated. As much harm can be done by undue haste as by unreasonable delay. Here indeed we find a temptation in opportunities. Often the sight of the means to do evil deeds makes evil deeds done. Two dangers therefore continually beset us, first the danger of neglecting opportunities, secondly the danger of being tempted by a promising chance into doing something of which our conscience does not approve. It is an easy matter after the wrong is done to dogmatize sagely, and to appease our conscience by saying that such and such a step was taken at an inopportune moment. Nevertheless it is painfully true that many a man misses his mark in life through neglecting some great opportunity, hence the necessity of constant watchfulness.

"O, once in each man's life at least,
Good luck knocks at his door;
And whoso wins the flitting guest
Need never hunger more.
But while the loitering idler waits
Good luck, beside his fire,
The bold heart storms at Fortune's gates
And conquers its desire."

Young men of today who have to establish a footing amidst the strenuous struggle and fierce competition of modern existence must keep their faculties wide-awake.

"The heights by great men reached and kept
Were not attained by sudden flight;
But they, while their companions slept,
Were toiling upward in the night."

How to Balance a Polar Duplex.

To balance a polar duplex first ask the distant office to ground, then turn the home switch to ground. This throws the battery off at each end of the circuit. Then adjust the armature until it will remain on either contact point, or vibrate evenly. The object in doing this is to make the pull due to the permanent magnetism in the steel magnet equal on both sides. This can be attained only when the lever armature is exactly midway between the ends of the two magnet cores. When there is no current flowing these two cores are of the same polarity, and always opposite in sign to that of the end of the armature, for the entire mass—armature and cores—are both one and the same piece of metal. The larger portion of the steel is bent into the shape of a horseshoe, with the blunt end split into two cores, so that the pivoted lever armature on the other end can rest between them. As every magnet has two poles, each extremity must necessarily be of opposite sign.

Having centered the armature, switch on the home battery. As the main and artificial lines are yet of unequal resistance, there will be more current flowing in one coil of the relay than in the other. The excess of current in one coil will, therefore, flow around that end of the magnet, and, overcoming the weak magnetism already there, give it a polarity of its own, according to the direction taken. While this condition obtains, the armature will cling strongly to one side. This must be remedied by changing the plugs in the rheostat until the armature will again remain where placed, or at least vibrate evenly as in the first place.

The next thing is to eliminate the "kick" that comes in at the moment the current is reversed. During this fraction of a second the home battery is disconnected, and the current is freed. This removes the magnetism in the relay due to the home current, and permits the original permanent magnetism in the steel to interfere during the operation.

In order to preserve the existing polarity of the relay at such moments, the charge in the condenser is freed and brings about the desired result. Restoration of the original current restores the normal condition and recharges the condenser for future use. The proper amount to be drawn from the condenser is regulated by changing the plugs in the latter until the manipulations of the key produce no "kick" on the relay. One of the most satisfactory ways of accomplishing this is to first ask the distant office to cut in and close his key, then proceed to adjust the condenser. If the "kick" does not appear when the relay point is closed, it surely cannot cause trouble at any other time, because that is the actual condition when a signal is made.

Telegraph Competition vs. Government Ownership.

(Concluded from page 102, March 1.

[Following is the concluding portion of the paper presented by Mr. Clarence H. Mackay, president of the Mackay Companies, at the annual meeting of the stockholders in Boston, February 15, addressed by him to the chairman of the joint committee on interstate commerce, on the subject of telegraph competition vs. government ownership, the first portion of which was printed in our March 1 issue.]

Government ownership would not give as quick service nor could it give as low telegraph rates as at present exist without creating still more formidable objections. Government ownership would mean a great annual deficit, if European government telegraphs or the United States Government post office systems are to be considered as precedents. In a speech in the House of Commons on April 30, 1914. Postmaster-General Hobhouse of Great Britain said that within the last forty years the telegraph expenditures of the British Government exceeded the telegraph receipts by $110,000,000, not including interest on the original purchase money nor interest on the annual losses, nor any provision for amortization. If these were included the loss would have been $200,000,000. The annual loss is shown by the following table:

Year Ending March 31		Receipts	Actual Operating Expenses
1908	....	$15,516,805	$17,542,840
1909	....	15,492,260	18,361,270
1910	....	15,827,745	17,995,390
1911	....	15,830,035	18,478,075
1912	....	15,747,420	18,786,840
1913	....	15,881,635	17,620,250
1914	....	15,591,080	17,545,050
1915	....	17,094,770	18,570,990

		Operating Loss	Total Annual Loss Including Interest Paid and Fresh Money Expended
1908	....	$2,026,035	$4,847,425
1909	....	2,869,010	5,233,785
1910	....	2,167,645	5,246,065
1911	....	2,648,040	5,933,365
1912	....	3,039,420	5,340,740
1913	....	1,738,615	5,876,735
1914	....	1,953,970	6,058,710
1915	....	1,476,220	6,164,775

As late as February 21, 1916, a committee appointed by the British Government to look into the question of retrenchment in the public expenditure, reported on the government-owned telegraphs as follows:

> "The history of the telegraphs is most unsatisfactory. They were taken over in 1870 at a cost (including capital expenditure on extensions) of £10,129,687 [$50,648,435], in the anticipation that they would yield a profit to the State. After the second year of post-office management the profit failed to cover interest on the capital outlay. Year by year the financial position has grown worse. In recent years the loss upon working has not been less than £1,000,000 [$5,000,000] a year, and this loss includes nothing for interest due to the State upon the aggregate losses of previous years."

If the British Government had left the telegraphs in the hands of private individuals, the rates would have been just as reasonable as now and the government would have avoided the loss of not only about $200,000,000, but also the taxes which they would have been receiving from the private companies, and the interest on both of these sums, and the public would have been receiving a much improved service.

We might go on with the same story about nearly every government-owned system in Europe. They are all conducted with financial losses and poor service. Even the Australian Government telegraph system, little as it is, shows a deficit of $757,230 for the eighteen months ending June 30, 1914, according to the official accounts of the Australian Post Office —and we have heard much of the great "success" of government ownership in Australia.

Government ownership cannot compete with private enterprise. The first act of government ownership is to strangle every form of competition; to destroy every instrument by which the efficiency and economy of the government-owned enterprise can be measured.

Governments owning telegraphs tax all the people to make up the deficit due to furnishing telegraph service to a very small proportion of the people, because after all only about 5 per cent. of the entire population depend on the telegraph service or use it for more than occasional purposes. With government ownership there always exists agitation on the part of the telegraph-using public for better service and lower rates. Government ownership of the telegraphs would add another large body of office holders to the government service and would create another almost equal body of office seekers. Government servants are well paid and work short hours already, but there is a movement on foot to force up government employes' salaries by political pressure, obviously for its effect on the wage situation generally. Government salaries are paid out of taxes. Wages must come out of profitable enterprise.

The value to the American public of competition in telegraphy is shown by what the Postal Telegraph-Cable Company has accomplished in the way of reducing telegraph rates. When that company began business in the 80's the telegraph rates were high and the service was bad. The Eastern and Pacific Coasts were twenty-four hours apart. The entry of the Postal Telegraph-Cable Company into the telegraph field as a competitor led at once to a war of rates. The following table, setting forth the rates for a ten-word message before and after the telegraph war, whereby millions of dollars annually have been saved to the people of the United States by the reductions, speaks for itself:

Points Between:—	Monopoly Rate Before the Entry of the Postal	**Present** Competitive Rate
New York and Arkansas.....	$1.00	$0.60
" " " California ...	1.50	1.00
" " " Colorado	1.25	.75
" " " Idaho	1.50	1.00
" " " Kansas	1.00	.60
" " " Louisiana ...	1.00	.60
" " " Minnesota ...	1.00	.60
" " " Montana	1.50	.75
" " " Nebraska	1.00	.60
" " " N. Carolina ..	.75	.50

The Public Service Commissioners, who are in touch with public sentiment throughout the country on these matters, at their convention held in San Francisco, on October 12, 1915, as previously mentioned received from the Committee on Telephone and Telegraph Rates and Service an exhaustive report on this subject of government ownership, including letters and opinions from leading public men throughout the country. The following are their conclusions:

> "When we consider, therefore, how intimately the public welfare is bound up with an adequate development of our wire service, and the deplorable consequences—from the standpoint of extent, quality and cost of service—which have followed attempts of foreign countries to develop their wire systems by direct governmental agency; when we consider, too, that this unfortunate condition has come about despite an acknowledged superiority in point of administrative efficiency of foreign governmental machinery over our own; when we consider, finally, that an analysis of the causes underlying the strikingly inadequate character of the wire service abroad, reveals governmental defects inherent in direct governmental management, but fortunately absent under a system of governmental regulation, it would seem that, until such time as evidence to the contrary is adduced of a more conclusive character than that presented by the Postmaster-General and his assistants, it is preferable that the government in this country continue its policy of dealing with electrical systems of communication by regulation."

Then there is another thing. It would cost the government about two billion dollars to take over the telegraph and telephone lines. In fact, it might cost the government a great deal more, because under the decisions of the United States the earning capacity of these vast properties would have to be paid for. The Supreme Court of the United States in the Monongahela Canal case, where the United States Government condemned a lock and dam, said (148 U. S. 329):

> "Before this property can be taken away from its owners the whole value must be paid; and that value depends largely upon the productiveness of the property, the franchise to take tolls."

The same question was decided by the Supreme Court in the Omaha Water Works case, where the court held that even though the city in its original franchise had reserved the right to take the water works "at an appraised valuation * * Provided, that nothing shall be paid for the unexpired franchise of said company," yet as the court said (218 U. S. 202):

> "The option to purchase excluded any value on account of unexpired franchise; but it did not limit the value to the bare bones of the plant, its physical properties, such as its lands, its machinery, its water pipes or settling reservoirs, nor to what it would take to reproduce each of its physical features. The value in equity and justice must include whatever is contributed by the fact of the connection of the items making a complete and operating plant. The difference between a dead plant and a live one is a real value, and is independent of any franchise to go on, or any mere good will as between such a plant and its customers."

Nor is this all. The government would have to deal with telegraph lines on the railroads. Most of those telegraph lines have been constructed jointly by the telegraph companies and the railway companies, under contracts which give the railroad companies substantial rights in those telegraph lines, the usual contract being that the telegraph company furnished the poles, wires, cross-arms and other material, while the railroad company furnished the labor to erect and maintain the lines. The courts hold that this makes those telegraph lines joint property of the telegraph company and the railroad company. To the great surprise of the British Government after taking over the telegraph lines from the telegraph companies, large claims were put in by the railroad companies for their contract rights in the telegraph lines built on the railroad right of way under contracts very similar to the American contracts referred to. The British Government finally had to pay to the railroads the appraised value of those contracts—and it was a very large sum. The American Government could not acquire title to the telegraph lines in the United States without paying a large sum of money to the railroad companies in addition to buying out the telegraph companies. Railroad-telegraph contracts have proven to be exceedingly valuable to the railroads and, at the same time, have proven to be a source of very great loss to the telegraph companies. The old-fashioned railroad-telegraph contract has turned out to be an improvident contract so far as the telegraph companies are concerned. So improvident, in fact, have they proven to be that the Postal Telegraph-Cable Company has refused for several years past to make any more on the old terms. As fast as the few which it has expire, by their own terms, they will not be renewed. A careful analysis of the workings of those contracts has demonstrated that the telegraph company suffers great losses under them. The contract which the Postal Telegraph Company at present has with the Pennsylvania Railroad east of Pittsburgh shows a loss to the telegraph company of over one hundred thousand dollars a year for the past fifteen years during which the contract has been in existence. Fortunately for the Postal Telegraph Company, that contract expires in June of this present year, and, of course, will not be renewed. In another contract which the Postal Telegraph-Cable Company has with a large railroad system, the railroad company by the terms of the contract has its station agents attend to the telegraph business at the stations and the railroad pays the station agent's wages for all of his work, this being the usual provision in the railroad-telegraph contracts. During the past few years, however, the station agents, on account of the Postal Telegraph-Cable Company refusing to pay them a commission, have neglected the transmission of telegrams, and at times have refused to accept them at all, resulting in suits for damages being brought against the Postal Company. Fortunately the Postal Telegraph Company has very few of these railroad-telegraph contracts and has none at all in perpetuity.

All this shows that if the government should acquire all of the telegraph lines in the United States it would be assuming an indefinite liability in connection with these railroad-telegraph contracts, and judging from the experience of the British Government that indefinite liability would be the source of an immense additional cost in acquiring the telegraph lines.

The foregoing facts and figures would seem to demonstrate that there is no reason why at present the government should acquire the telegraph lines. So long as the Postal Telegraph-Cable Company keeps up present competition, the public will continue to get better service at cheaper rates than under a government monopoly, unless, of course, the government after acquiring the telegraph lines should arbitrarily reduce the rates and make up the deficit by taxation. No one could justify that in view of the fact that so small a proportion of the public send telegrams, except at rare intervals in case of death in the family or travel.

As to the government acquiring the submarine cable lines, we cannot see how this could be accomplished nor that it would be of any advantage to the United States Government, its business public and its citizens. It should be understood that there is only one cable running direct from the United States to Europe, and for sufficient economic reasons of cost, efficiency and maintenance there is not likely to be another. It is the cable of the French Cable Company (a foreign corporation), running from Cape Cod, Mass., to Brest, France, a distance of 3,176 miles. All the rest of the cables from the United States form only parts of the trans-Atlantic cable systems. They run from points in the United States to points in Nova Scotia, or Cape Breton, or Newfoundland, the French island of St. Pierre, or the Portuguese Azores, and thence traverse the Atlantic to Great Britain, France and Germany. Hence, the most vital sections of the cables, namely, the Atlantic Ocean portions, are completely under the jurisdiction of the British or French or Portuguese Governments, as the case may be. None of those governments would permit the United States Government to own such portions of the cables as land on the territory of such foreign governments, just as the United States Government would not permit a foreign government to own the American Pacific Cable landing at American points. It is true that certain cables connecting Great Britain with continental Europe are owned jointly by the British and continental countries where they land, but in such cases the cable is under the control of each government, because either end of a cable can prevent the cable from being operated and either government can suspend the operation at will. In the Atlantic, however, the United States Government could acquire only one end of the cable lines from the United States to Canada, and hence the most essential part of the control would remain in the hands of the British, French and Portuguese Governments, namely, the mastery of cable communication between Canada or the Azores and Europe. This might be a prolific source of international complications. We do not believe that the American Government would care to embark on any such adventurous expedition. All governments will allow a foreign corporation to make landings on their shores because foreign corporations may be controlled by the governments on whose soil the landings are made, without disturbing the relations between the two governments. It would seem, therefore, that instead of raising questions as to government ownership of cable facilities, the United States Government should be guided by the example set by British, French and German Governments in fostering the development of private cable enterprises. In fact, although both the French and German Governments own their land telegraph systems, yet both of those governments have recognized the impossibility and impracticability of owning trans-Atlantic cable systems, and accordingly have assisted in developing private enterprises for that purpose, not only between those countries and the United States, but also between those countries and Africa and South America.

The situation is peculiar as to competition in telegraph and cables in this country. That seems to be about the only kind of quasi-public business that still has competition. Railroads have very little, and that little is fast disappearing Street railroads naturally have none. The telephone is rapidly becoming a monopoly. As to electric light companies, gas companies, water works companies and power companies, competition is almost a thing of the past. In fact, public policy is rapidly favoring monopoly as to those companies. The highest court in New York only a short time ago said (207 N. Y. 98, 99):

> "It is the settled policy of the State, arising through an extended and instructive experience, to withdraw the unrestricted right of competition between corporations occupying, through special consents or franchises, the public streets and places and supplying the public with their products or utilities which are well-nigh necessities."

Other states and state commissions have adopted the same policy; and undoubtedly it is the correct policy. With telegraph lines, however, the case is different, and we believe that if at any time competition in the telegraph business should cease, the public would insist at once that the government take over the telegraph lines. There would be no possibility of another competing telegraph company arising. There would be no room for such. Already the through highways of this country—particularly in the East and northeast—are fully occupied by pole lines of various kinds. Moreover, the cities throughout the country would not allow their streets to be torn up again from end to end. Even if they did, the cost would be prohibitive in view of the narrow margin of profit in the telegraph business. There will never be another telegraph company spreading over the entire country—and no telegraph line can succeed unless it does cover the whole of the United States. This is the history of the telegraph. Certain railroad corporations, disappointed at not being able to renew old contracts with the Western Union Telegraph Company, have threatened to organize a telegraph company of their own. They will find, however, that while they can construct telegraph lines on their own railroads, they cannot hope to cover the whole country, and when it comes to dividing a telegraph toll between two companies the present small margin of profit would disappear, and there would be a loss to both companies. Hence we say that the Postal Telegraph Company is and will be the last competing company in the telegraph business, and if its independent ownership, management and control should cease and it should pass into other hands, that would be the end of competition in telegraph, and government ownership of telegraph lines would quickly follow. So long, however, as competition continues, there is no occasion for government ownership.

Our worst troubles are those that never happen.

The Maintenance of Telegraph Lines*

BY R. M. TELSCHOW, ASSISTANT CHIEF OPERATOR, POSTAL TELEGRAPH-CABLE COMPANY, NEW YORK.

The general public little realizes the continual struggle being waged between the telegraph lines and the elements. The telegraph operator, having an intimate relation with the business of electrical communication, understands the frailties of pole lines; so does the lineman, who responds to the call of duty in all sorts of weather and plays a man's part in keeping open the various channels of telegraphic traffic, under the directing hand of experienced wire chiefs. The linemen sometimes suffer untold hardships, and risk their lives in the performance of their duties in restoring communication, rendering a service not only to the company which employs them but to the community at large.

Laws enacted by the Federal government and various states are designed to safeguard the electrical arteries, which are so important to the welfare of the nation, from the destructive hand of vandals. Heavy penalties are provided to punish those who wilfully destroy or molest telegraph or telephone wires, but the deadliest foe to the magic trail along whose smooth metallic path whirs an endless stream of messages is, of course, bad weather.

It may be a terrific wind storm which blows over the poles or tangles the wires, or it may be an accumulation of ice on the wires which causes the slender strands to break from sheer weight. Extreme cold has a tendency to contract the metallic strings, and it is not an uncommon occurrence to find numerous circuits snapped in every direction following zero weather. In California, the land of big trees, big mountains and big snows, the telegraph linemen sometimes have to dig the wires out of the deep snow. Again, a tree may be felled by a backwoodsman or as a result of an erratic bolt of lightning, directly across a telegraph or telephone line, carrying the wires to the ground and rendering them useless until repaired. Even rain contributes to the uncertainties and risks incurred by wire systems. Ordinarily, rain storms are not detrimental to the operation of overland telegraph lines. In certain cases rain helps operating conditions, but when a heavy fall of rain succeeds a protracted dry spell, the dust which has gathered on insulators, cross-arms and poles becomes moistened and the resultant paste affords an excellent medium of escape for the current. A little leakage on each pole soon causes the loss of considerable current. To render such circuits workable it is necessary to "repeater" them, which means the introduction automatically of fresh electrical impetus at intermediate stations where equipment for that purpose is available.

Cold weather contracts, and heat expands metal. Telegraph wires are manufactured of iron or copper, and to provide against the changing temperature during different seasons of the year, it is necessary to provide a certain margin of slack when stringing wires from one pole to another. High winds frequently cause the wires to swing, and where too much slack has been allowed, they constantly collide with one another, causing a jumble of signals, which is not only confusing but extremely annoying to operators, and multiplies the possibility of errors. The wire chiefs at the large terminal offices endeavor to locate the exact section where the disturbance is most pronounced, and there are sometimes a number of wires through the storm area which are strangely unaffected by the trouble. These are substituted for the ones swinging to maintain long as possible important circuits over direct routes. When every wire on a particular pole line is affected, the only thing possible is to rearrange circuits avoiding the disturbed territory, or divert traffic over other routes. This does not necessarily imply slower service. It is reasonable to assume, however, that the impairment of a large number of wires from any cause, cripples the facilities of the telegraph company and a congested condition is likely to occur on other circuits.

Why don't the companies place the wires underground? you may ask. To the lay mind that is the solution promptly advanced on each occasion that the wires suffer annihilation through the elements. Apart from certain electrical objections which would have to be overcome, is the important item of expense. It would cost a fabulous sum of money to bury the wires. Under normal conditions the wires work better overhead than underground. Induction (or leakage from one wire to another without actual contact) plays a large part in pracical telegraphy, and where the wires are laid close together, as in a cable, the problem becomes a serious one. Hence, it is not only the expense involved which prevents the companies from putting their wires underground, but the added electrical difficulties. Doubtless these obstacles will be surmounted in time.

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[*] Erie Railroad Magazine.

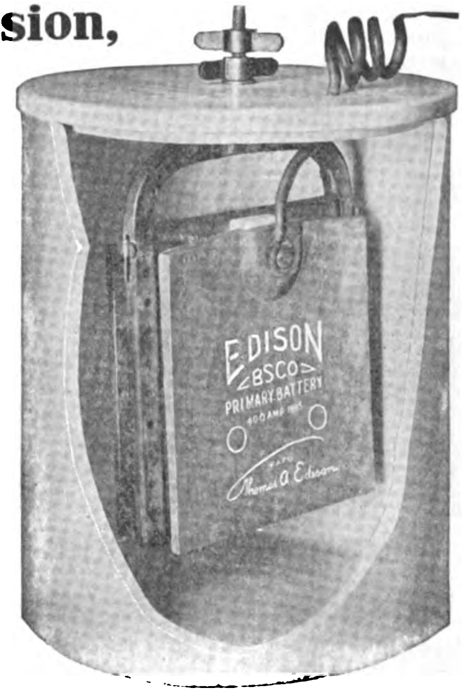
ELECTRICAL HEATING.—In all electrical heating apparatus heat is obtained by passing an electric current through a wire or conductor. The amount of heat generated depends on the amount of the current and on the resistance to the passage thereof. If the resistance is doubled while the current remains the same the amount of heat generated is doubled. If, however, the current is doubled while the resistance remains the same, four times the amount of heat is obtained. The current depends upon the voltage and the resistance and is equal to the voltage divided by the resistance.

ELEKTRON is the name of an electrical magazine published monthly at Reykjavik, Iceland. The leading article is on the Icelandic telegraphs and telephones, by Mr. Gisli J. Olafson, one of the officials of the government telegraph and telephone department, who visited this country a year or more ago and studied American telegraph and telephone methods. This article is printed in the Danish and English languages. The magazine is modern in its make-up and character and breathes progress.

Mr. J. Q. Morgan, Whitefish, Mont., writes: "Enclosed find money order for $2.00 covering subscription to TELEGRAPH AND TELEPHONE AGE. Never allow it to expire."

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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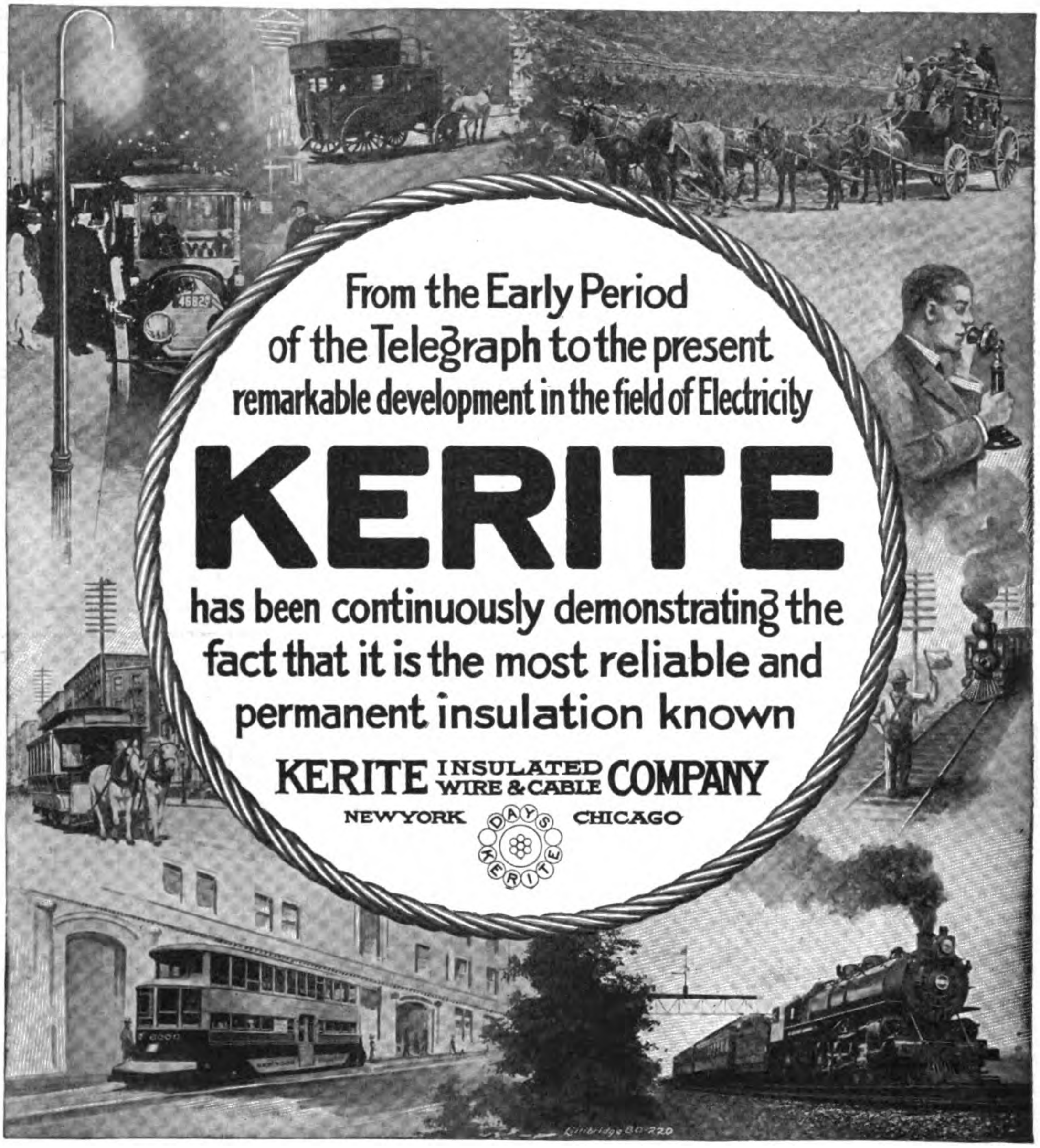

From the Early Period
of the Telegraph to the present
remarkable development in the field of Electricity

KERITE

has been continuously demonstrating the
fact that it is the most reliable and
permanent insulation known

KERITE INSULATED WIRE & CABLE **COMPANY**
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THE RAILROAD.

Mr. F. G. Adams, circuit manager of the Baltimore and Ohio Railroad Company, Baltimore, Md., recently fell, breaking one of his arms in two places.

Extension of Electric Power on Great Northern.— The Great Northern Railway is to extend its system of electric propulsion and will build a hydro-electric plant on the Chelan River to produce 150,000 horse-power to operate the company's line between Spokane and Seattle, Wash. The company is planning to electrify its coast lines between Vancouver, B. C., and Portland, Ore., a distance of over 500 miles.

Meeting of Committee No. 5, Association of Railway Telegraph Superintendents.

A meeting of Committee No. 5 of the Association of Railway Telegraph Superintendents was held in the office of Mr. B. A. Kaiser, of the American Telephone and Telegraph Company, at 195 Broadway, New York, on February 27. Those present were J. F. Caskey, of the Lehigh Valley, South Bethlehem, Pa., chairman; I. C. Forshee, Pennsylvania, Philadelphia; W. M. Gould, American Telephone and Telegraph Company, New York; N. E. Smith, New York, New Haven and Hartford, New Haven, Conn., and W. L. Cook, Reliable Electric Company, Chicago, Ill.

The committee went into the work of the present year very carefuly and arrangements were made for obtaining certain data to be acted upon later in the formulation of the annual report of the committee to the association at the Washington convention, which will be held September 18.

Another meeting of the committee will be held later.

Loud Speaking Transmitters and Receivers on the Lehigh Valley.

Train dispatchers on the Lehigh Valley Railroad are no longer required to wear the cumbersome and uncomfortable head receiver and chest transmitter instruments when performing their duties This railroad is adopting the Stentor system of loud-speaking transmitters and receivers. This new apparatus is so designed that messages come in from the way offices on telephone receivers equipped with megaphones. The dispatcher can hear very distinctly what the way offices say to him without the necessity of being close to the receiver. Likewise in sending messages from the dispatcher's office to the way offices the use of the loud speaking apparatus enables the operator to talk into the transmitter in an ordinary tone of voice without the necessity of being close to it in each case. At the same time, messages received at the way offices are very clear and distinct, and in fact in every way the new instrument is a great improvement over the old style of chest transmitters.

At Easton, Pa., the Lehigh Valley Railroad has two train dispatching circuits, (one for the east and one for the west end of the New Jersey and Lehigh Division) equipped with the Stentor system. At Buffalo, where the railroad has one train dispatching circuit, taking in the entire Buffalo Division, the apparatus is likewise used. At Sayre, Pa., a trial is being made of these loud speaking transmitters and receivers on the three full dispatchers sets which work the main line from Sayre to Manchester, N. Y., the main line from Sayre to Ransom, Pa., including the Montrose and State Line and Sullivan branches, and the Ithaca, Willard and Naples branches.

Practically the entire line of the Lehigh Valley is equipped with train dispatching telephone lines. There are nine train dispatching circuits all told which, in actual use, have proved themselves efficient in the most satisfactory sort of way.

Addition to Phillips Code.

In our February 16 issue was printed an item stating that it had been suggested to spell out in future the word "how," in the Phillips Code, and use the abbreviation "hw" to indicate that a hard word was to follow.

Mr. E. E. Bruckner, the well-known telegrapher who revised the code and brought it up to date, does not agree with the suggestion. He says:

"First, no first-class sender ever goes over a word a second time. The man who runs through a difficult word and then repeats it is a 'rattle brain' and cannot make an average if given ninety minutes to the hour.

"Secondly, a first-class sender will transmit hard words and proper names at such a decrease of speed as to be a warning within itself, and also enable the receiver to get it down without extra effort.

"Thirdly, if difficult words are sent properly a prefix signal is not necessary, as I have just pointed out; and if such words are not so sent, then any prefix can only add extra confusion. For example, how can any prefix help the receiver when, for instance, the word 'irradium' is sent 'cirwium'?

"And this is the view of all my colleagues from whom I have sought an opinion."

OBITUARY.

William H. Magehan, a member of the Society of the United States Military Telegraph Corps, died in St. Louis, Mo., February 21.

INDUSTRIAL.

The Diaphragm Telegraph Sounder made by the Railways Labor-Saving Device Company, Davenport, Iowa, is growing in favor in railroad telegraph departments, and on commercial lines, as it meets all the local battery problems. Batteries are expensive to instal and to maintain, but with the diaphragm sounder the question of batteries need not be considered at all because locals are not needed where this instrument is available. The use of this sounder means elimination of battery costs, maintenance and trouble, especially in small stations where batteries usually do not receive proper care.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy, radio telegraphy and telephony, standard works have been freely drawn on for the substance. The questions following each department are made up independently of the books consulted and are prepared to enable the student to review his owrk.

The books from which the material is taken are "American Telegraphy," by Wm. Maver, Jr.; "Radiotelegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

THE GRAVITY OR CALLAUD CELL.

The elements of the gravity cell are a copper and a zinc plate. The solution in which the copper plate is placed is, primarily, that formed by the dissolving of "bluestone" in water. Bluestone is known in chemistry as sulphate of copper. The zinc plate is immersed in water, but a solution of sulphate of zinc is subsequently formed around it.

In the Daniell cell, which was the first constant cell invented, and of which the gravity, or Callaud cell, is a modification, the copper plate is placed in a solution of sulphate of copper. In the same cell is placed a porous cup containing a dilute solution of sulphuric acid in which the zinc plate is immersed.

The chemical action assumed to take place in the Daniell cell when the circuit is closed may, in general, be stated as follows: Oxygen attacks the zinc element, forming oxide of zinc which displaces the hydrogen of the sulphuric acid, forming sulphate of zinc; the hydrogen thus released attacks a molecule of the copper sulphate, displacing the copper of the sulphate, and forming with the sulphur and oxygen of the sulphate, sulphuric acid, which unites with a newly formed oxide of zinc, forming another molecule of sulphate of zinc and again releasing hydrogen which in turn displaces metallic copper, as before. This action, or an equivalent one, is supposed to take place throughout the cell, or until the copper plate is reached, the result being that the hydrogen is not set free, but, instead an atom of pure copper is deposited on the copper plate of the cell.

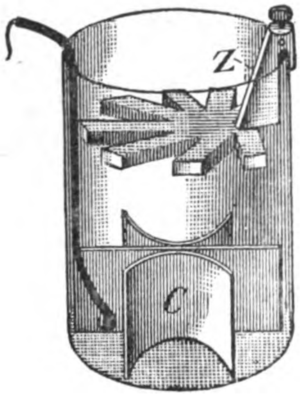

FIG. 1—GRAVITY CELL.

The chemical action that occurs in the gravity cell on closed circuit may be considered the same as that of the Daniell cell. Consequently, the elements of the cell remain as at first, copper and zinc, and a practically uniform, or constant electromotive force is thus maintained. In other words, since the hydrogen is diverted from the copper plate, polarization does not ensue.

The gravity battery is usually set up in glass cells about six inches in diameter by eight inches in height. The copper plate is placed in the bottom of the cell; the zinc plate is suspended by a hanger from the rim of the cell, as seen in Fig. 1. An insulated copper wire is connected to the copper plate as shown.

The form of zinc plate shown in the figure is called the "crowfoot." Occasionally, star-shaped zincs, which are suspended by a "tripod" resting on the top of the cell, are employed.

The bluestone, in crystals, is placed in the bottom of the cell, around the copper plate, and sufficient water is poured into the cell to cover the zinc. The bluestone dissolves quite rapidly, forming a solution of sulphate of copper.

After the cell has been in use for a short time a certain amount of sulphate of zinc is formed. This is also dissolved in the water of the cell, but, owing to the respective specific gravities of the two solutions, they do not speedily mix; the sulphate of copper, being the heavier of the two solutions, remaining at the bottom. Hence the name of the cell.

While, however, as just stated, the specific gravities of the respective solutions keep the copper sulphate below the zinc sulphate, the solutions will eventually mingle unless the action of the cell is sufficient to use up the sulphate of copper as speedily as it is dissolved. When this is not the case the copper sulphate solution diffuses through the cell and is decomposed by the zinc plate; the oxygen joining with the zinc to form oxide of zinc, and the copper of the sulphate being deposited on the zinc as a black mud, in appearance. From what has been said it is obvious that this action will take place most rapidly when the cells are continuously idle, that is, open.

(To be continued)

QUESTIONS IN TELEGRAPHY.

What is a "constant" cell? Who invented the first constant cell?

What is the essential difference between the Daniell cell and the gravity cell?

Describe the chemical action of the Daniell cell.

How is the gravity cell usually set up?

What is the name of the zinc shown in the illustration?

What other type of zinc is employed in gravity batteries?

What is the "blue stone" used in gravity batteries?

What is the cause of separation of the blue solution and the white in a cell of gravity battery?

Telephony.

HOW A SMALL TELEPHONE SYSTEM IS OPERATED

Most of us living in the cities and larger towns are familiar with only one kind of telephone—that known as the "central battery" type, on which the mere act of taking the receiver from the hook summons the operator at the exchange. But there is another type, which, while it was formerly used all over the country, is now confined principally to the smaller towns and rural centers. This is the "magneto" system, on which, in order to call "central," it is necessary to turn a crank before taking the receiver off the hook.

We are going to describe, as simply as possible, the operation of a telephone system employing this "magneto" type of instrument. In order to do this, we shall trace the course of a message from one subscriber, through the exchange, to another subscriber, showing you just what happens from the time you turn the crank to call central to the time when you hang up the receiver and "ring off."

CALLING CENTRAL.

Let us suppose that you live in a small country town; that your telephone number is 72, and that you want to call up someone whose number is 49. You go to the telephone, turn the crank, and take down the receiver.

Now look at the diagram. At the left you will see your telephone, with the two wires that connect it with a socket or "jack" in the exchange switchboard, marked with your number, 72. Just above this jack you will see a small ball with the black side turned outward, facing the operator, which is its usual position. But when you turned the crank you worked a small generator inside the body of your telephone instrument (this generator is termed a "hand generator"). This created a current of electricity which passed over the wires to the exchange, and made the ball swing around until its red side was exposed (white in the diagram), thus calling central's attention to your signal. The picture of the switchboard (Fig. 2) shows the jacks for each line (105 in this case), with the ball signal for each line just above the jack.

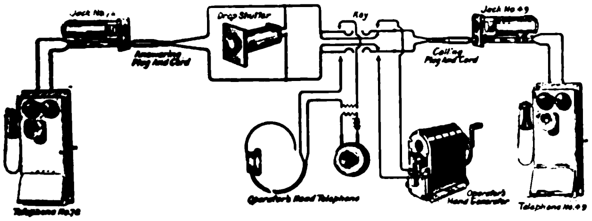

FIG. 1—DIAGRAM OF MAGNETO TELEPHONE CIRCUITS.

ANSWERING OF A CALL BY THE OPERATOR.

Ranged along the front of the switchboard below the jacks, on a horizontal board known as the keyshelf, are two rows of "plugs," which are fastened on the ends of flexible cords. The cords are held down below the keyshelf by pulley weights, like those used on window cords. A "plug" is an apparatus something like a short pencil stub, which can be inserted in a jack to make connections between the two wires of the jack and the two wires in the cord.

The row of plugs at the back are called "answering plugs, the front row "calling" plugs. Each answering plug is connected, through its cord, with the calling plug in front of it, the two together forming a "pair of cords."

When central sees the red signal over your number she picks up any one of the answering plugs and inserts it into the jack just below the signal—your jack, No. 72. This turns the ball back, so that its black side is again exposed, and also allows the current from your telephone to pass into that particular pair of cords.

On the keyshelf, in front of the plugs, is a row of levers, or handles, known as "keys," one belonging to each pair of cords. Central next presses back the key lever corresponding to the pair of cords whose answering plug is in jack No. 72. This operation allows the current from your telephone to pass through the answering cord to the telephone the operator wears strapped to her head. She asks you, "Number, please?"

You say, "Give me four-nine."

If you will now again refer to the diagram you can trace the current from your telephone to your jack, through the answering plugs and cord, and through the key to the operator's head-telephone.

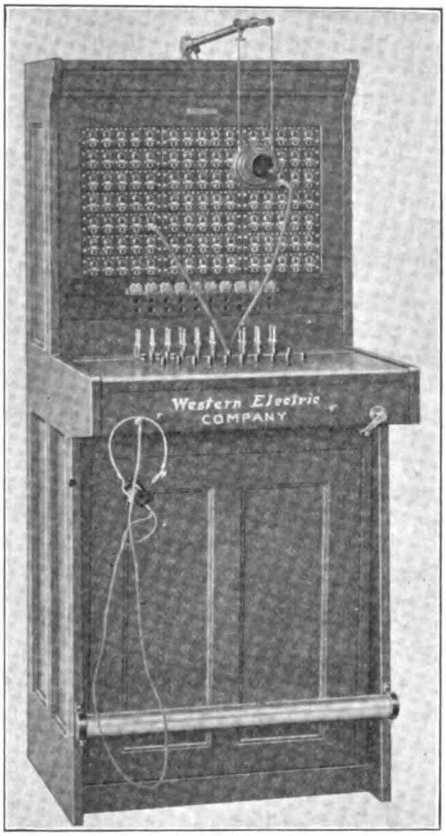

FIG. 2—SWITCHBOARD.

RINGING THE DESIRED SUBSCRIBER.

Central, leaving the answering plug in jack No. 72, now picks up the corresponding calling plug and inserts it in jack No. 49, thus connecting you with the line of the person you asked for. She then pulls the key handle toward her for a moment, and at the same time, with her other hand, turns the crank of a hand generator in the switchboard (this may be seen at the right, under the front edge of the keyshelf, in Fig. 2). This rings the bell of telephone No. 49.

If you will refer again to the diagram you will notice that when the key-handle is pulled forward the calling cord is disconnected from the answering cord, and connected with the operator's hand generator.

CONVERSATION BETWEEN SUBSCRIBERS.

As soon as central has "rung up" No. 49, she allows the key-handle to spring back to its normal vertical position, and you are in direct connection with telephone No. 49, as shown in the diagram. You are now ready to begin your conversation.

RINGING OFF.

When you have finished your conversation, you hang up the receiver and turn the crank to "ring off." This time the current from your hand generator, instead of moving the ball over jack No. 72 (this ball is "cut off" by the inserted plug), passes on through the answering plug and drops a small shutter that is set into the switchboard below the banks of jacks. There is one of these shutters for each pair of cords. (Fig. 2 shows a pair of cords in use, with their corresponding shutter dropped for a "ring off" signal). This dropping of the shutter acts as a signal to the operator, who, first making sure that you are through talking, pulls the answering plug out of jack No. 72, the calling plug out of jack No. 49, and resets the drop shutter.

You and party No. 49 are now disconnected, and will remain so until either of you sends or receives another message.

Radio Telegraphy.

STATIC AND MAGNETIC FIELDS NEAR A WIRE.

If a long wire is placed vertically and positive and negative charges are alternately applied at the bottom and flow along the wire, we shall have near the wire alternately opposite static fields, due to the charges; and at the same time alternately opposite magnetic fields due to the alternating currents. Thus, Fig. 6 shows in perspective the wire with a positive charge, surrounded by its vertical static field S and its horizontal magnetic field M, and Fig. 7 the wire with a negative charge and both its fields reversed in direction. Both the static and magnetic lines as seen when projected on the plane below the wire are shown together in Fig. 8, where the magnetic lines are circles, as in Fig. 4 and the static lines are straight, being radial with respect to the circles.

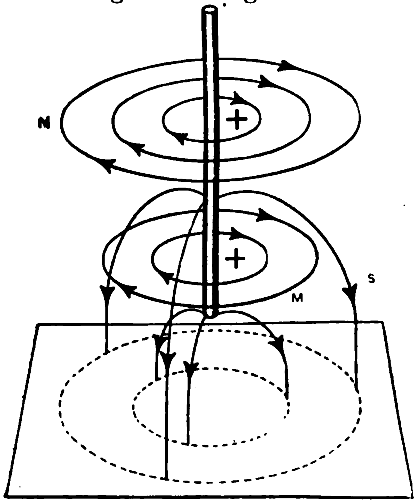

FIG. 6.

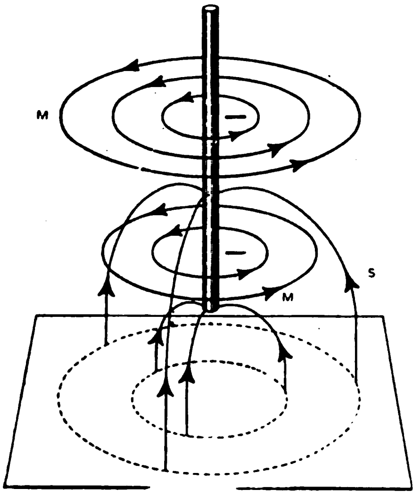

FIG. 7.

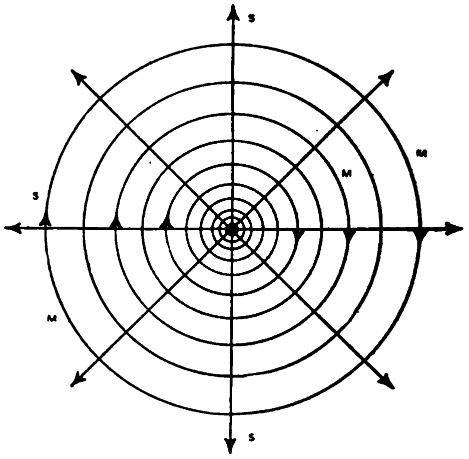

FIG. 8.

RADIATION OF ELECTROMAGNETIC WAVES.

These two fields of force changing their direction and intensity with great rapidity and traveling outward from the wire in the medium called the ether with the velocity of light, 300,000,000 meters or 186,000 miles per second, are the electromagnetic waves of radio telegraphy. They spread simultaneously radially outward and upward from the antenna as this vertical wire is called. The energy of the varying electric charges and currents is thus imparted to the medium, or is radiated.

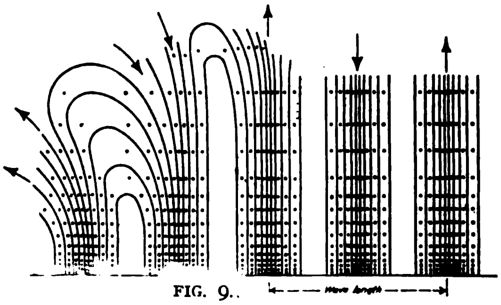

FIG. 9.

The two fields constituting the wave and their outward motion in radiation are shown in a general way in Fig. 9, where the electric field is indicated as lines and the magnetic field as dots, this latter being necessary, as in Fig. 5, because the magnetic field is perpendicular to the plane of the paper. At great distances from the transmitting antenna the static lines become straight and perpendicular to the surface of the earth and the magnetic lines straight and parallel to the surface.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

What would cause alternately opposite static fields near a wire?

If a wire, as in Figs. 6 and 7, is charged with a positive and then with a negative current, or charge, how are the static and magnetic fields disposed around the wire in each case?

What is the speed of the electromagnetic waves through the ether?

How are electromagnetic waves propagated from the antenna?

Efficiency Engineering in the Telegraph Service.

(Continued from Page 112, March 1)

It is on record that a manager in a small city made requisition for a piece of electrical machinery. The requisition in being copied reached the supply department with the figures somewhat jumbled. The result was that the distant office received a piece of machinery too large to permit its passage through the ordinary size door. The manager was dumb-founded, and after several telegrams had been exchanged with headquarters it was learned that a very expensive error had been made and the company lost a great deal of money. This was all due to lack of system. Errors in big things and errors in little things are frequently traced to lack of method and system. Every man owes it to himself to be methodical, to be right as far as possible, and to simplify his work by following a system.

If a man fails to adopt a system he multiplies his own work and involves the work of others so that it takes many times the amount of labor to accomplish an object than it should have taken if method and system had been called into use.

It is less work to do a thing right than to do it wrong. It is true that the brain must be called upon in the exercise of care but brains never wear out.

It is remarkable how many requisitions for material reach headquarters in such shape that they have to be returned to the originating point for explanations. Material for which the office has no use is ordered. The quantity asked for is out of all proportion to the requirements and in many other ways the requisition is prepared in a slovenly manner and disgusts those who have to handle it. It is a matter of record that frequently offices have to be called on the wire from headquarters and asked about various items found on the requisitions which could not be understood. This is all wrong and it makes the work at headquarters expensive and unsatisfactory. A little care in the preparation of the papers, which is system under another name, would have saved much trouble and annoyance.

Every requisition is now thoroughly supervised at headquarters and if any errors exist they are most likely to be discovered and remedied before the actual shipment takes place. If it is necessary that a clerk should be trusted with the compilation of a requisition the manager or chief operator of an office should scrutinize it carefully and see that it reflects creditably on his department. This will obviate the necessity of those at headquarters passing unfavorable comment on the sloppy work performed at the distant offices.

Telegraph and telephone officials carefully watch every employe in the service. If a man is observed studying educational articles on telegraph and telephone engineering such as are found in the columns of trade publications a favorable note is placed along side of his name and he is selected for promotion when the opportunity offers. Employes are promoted on the strength of what they know and the officials will not take chances in advancing those they do not know. Employers are at all times on the lookout for competent people and a man has to be unusually reticent if he can succeed in hiding his light under a bushel.

The publisher of this journal has several times been requested to submit the names of men whom we thought would make good canvassers for business. We only had an example of their work in behalf of this journal, but that was quite sufficient. Over fifty agents of this publication were promoted during the year 1916. Many of them were selected because of their painstaking methods in handling our affairs, which were regarded as large enough to indicate the caliber of the man and that was quite sufficient for those entrusted with the selection.

It is possible, of course, but very improbable, to keep a qualified person from advancing. If his own employer does not recognize the ability of the man someone else will and promotion will follow in spite of local conditions and personal hindrances. Every man is fitted to do one thing better than another. It would not do for us all to prefer the same line of work. Some telegraph people are better fitted to handle men in an operating room; others are again better qualified to meet the public as managers of offices. Our attention has frequently been called to the statement that Mr. So and So is a misfit. If this is true the superior official should study what the individual lacks to make his services acceptable and ascertain if there is a position in the service the misfit is qualified to fill. If there is that is where he belongs. We frequently record in these columns the transfer of someone from the managership to a chief operator's position and vice-versa. Others again are recorded as being transferred from one department to another all to the advantage of the company.

There are many ways of improving the service and it is the business and duty of every one on the pay roll of a company to do his share in searching for and suggesting improvements.

(To be Continued)

Wisdom from a Book.

Extracts from a book on the practice of telegraphy:

A ground wire is necessary to ground all messages during a storm, or at other times when friction may be very great in order to prevent danger.

Wet batteries, generally used by telegraph companies are composed of water, blue stone, copper and zinc.

The switchboard is simply a board of well-seasoned wood, fitted in front with metal strips running vertically and terminating in the thumbscrews.

A circuit is formed by two wires connecting the key and sounder of the instrument with the battery.

It is the consummation of the minerals composing the batteries that occasions the friction necessary to move the instrument or cause the sounder to vibrate. Without a complete circuit the instrument will not sound, for there is no friction.

Linseed oil poured over the top of the water in batteries does not affect the friction at all.

MR. JEFF W. HAYES' DEPARTMENT.

The Pleiades Club.

CHAPTER IX.

All of the telegraph people residing on the planet Mars had gathered around in the grand stand to get a front view in the tournament which was scheduled to come off February 22, Washington's birthday. There was no crowding or elbowing or pushing, as there was a place for everyone, and everybody was in his place.

A gigantic sounder was in the middle of the arena specially arranged so all could hear, and many good-natured jokes were told on this instrument while waiting for the big event to take place.

All ex-members of the profession were there and there were no goats or black sheep, and only joy and happiness prevailed. It did one's soul good to see the forms and faces of the old linemen and battery men who were in the assemblage, all of whom were on the alert for line or battery trouble, just as they were erstwhile on earth, and all seemed anxious to do something to make the tournament an affair never to be forgotten. They included such old-time linemen as George Melton, Harry Collins, Joe Keenan, Tom Dushane, John Crouch, Tommy Calahan, Delos Rich, Jimmy Brush and many others well known in their day.

At this juncture a great noise was heard across the river Styxx—the name is spelled with a double "x" on Mars. Shots from fowling pieces, small pistols, hurrahing and cheering of all kinds were distinguished behind a column of dust, which, presently clearing away, disclosed to view an immense army of regulars and irregulars, some clad in uniform, bearing rifles, but mostly composed of a uniformed delegation bearing weapons of a more ancient date.

Fifes and drums were playing, adding inspiration to the scene. A herald appeared before the grand stand and announced that this being Washington's birthday it was only immensely proper to pay the respects to that great personage, inasmuch as he was coming with his Continental troops to celebrate the day and participate in the tournament.

Just then the first column of General Washington's army swung into line, bivouacking on the green sward fronting the grand stand. A long list of generals and presidents arrived in carriages, but Thomas Jefferson, with true Jeffersonian simplicity, appeared mounted on a milk white steed.

"First in war, first in peace," began Abraham Lincoln, addressing the "Father" of his country, but he was interrupted by General Washington, who extended his hand, remarking "And I will shake hands with him who is first in the hearts of his countrymen." Mr. Lincoln agreed to share that honor with his illustrious patron and friend, and the cannons belched forth the regulation presidential salute.

A little hatchet with a cherry handle was suspended from General Washington's belt, a little after the style in which the Scotchman wears his paint brush.

Many old British generals were present but not in line. Marquis De Lafayette, smiling, and full of bonhomme, went up and down the line, shaking hands with the presidents and soldiers alike.

The bulletin board on the planet Mars is on the azure sky and an electric pen propelled by wireless telegraph copies off in red ink, not unlike tongues of fire, indelibly all items of news.

George Washington and his heroes were reading the latest bulletins from the big war, and as they read a look of deep concern covered the faces of all. "I don't like this late news," said the general, "but I know my country is in safe hands and that President Wilson will be backed by congress in everything he may want to undertake. But this is not war, it is barbarism."

"We fought like gentlemen," ejaculated Lord Cornwall, and General Washington doffed his hat to acknowledge the compliment.

"It will be all right to delay giving any advice to President Wilson until he really needs it," continued Gen. Washington, "but I wish to inform him that he has a mighty army up here in Mars who will appear at the proper time to lend aid and assistance to his efforts."

"Come, my illustrious predecessor, come with me and after a little speech-making we will partake of the hospitality of the Pleiades Club," thus spoke Abraham Lincoln as he took the arm of George Washington for a stroll around the grand stand.

"I was very much interested in telegraphy and telegraph operators during my career at the White House," Mr. Lincoln continued, "and I wish to introduce you to some of those I met and who will, no doubt, take part in this tournament, now about to take place."

"We had nothing but 'wig-wagging' from the tops of high hills and some signal fires during my time," said General Washington, "and this new invention by my dear friend, Professor Morse came to serve his country in good stead, and I will be delighted to meet all your old telegraph friends."

The two presidents then met the following old-timers who were in the United States service during the civil war: H. A. Bogardus, W. K. Applebaugh, S. M. Brown, Madison Buell, W. W. Burhans, M. J. Childs, Eli Cole, C. D. Hammond, J. D. Truax, Isaac McMichael, J. La Bonte, G. H. Peck, W. B. Somerville, L. B. Spellman, O. K. Newton, F. A. Nash, Geo. Purdon, and many others.

President Fred Catlin of the telegrapher's tournament decided it would be more patriotic to devote the day to entertaining the great presidents and generals in a different way and let the harder part of the programme come along later, and his views were accepted.

The members of the United States Military Corps were everywhere introducing and being introduced, Fred Loomis, George Baxter and Marion H. Kerner being particularly happy.

General Grant was surrounded by a throng of admirers. He proved himself not very strong on the "send" but a most cheerful listener.

"When I was with Grant," began Fred Loomis.

"When were you with Grant?" queried George Baxter.

"Oh, that is just in the song," was the laughing reply, and even General Grant smiled as he remembered about the tramp 'who was with Grant' just ten years before the war.

No attempt was made to give an exhibition of fast sending or receiving, as the United States Military Corps were too busy in showing attention to former officers, with whom now, however, they hob-nobbed like college chums.

It was a glorious day, filled with enthusiasm, glowing speeches and patriotic sentiment.

General Washington's old body-guard, "Sam," was on hand and he took much delight in relating the oft-repeated story how he approached Mr. Washington, one day, doffing his hat at the same time.

To everyone's surprise, Gen'l Washington immediately took off his own head-gear.

"How is it that you take off your hat to a colored man?" was asked by the English ambassador.

"Because he took off his hat to me, and I will not permit even a negro to outdo me in politeness," replied the general, and the little incident became historical.

Time and space will not permit a lengthy report of this extraordinary meeting, but we may have more to relate about it at some future time.

The great Mars telegraphic tournament is now going on and a full report of the most important events with the names of the participators will occupy a later chapter.

They Never Spoke As They Passed By.

It was a great pleasure to meet in Vancouver, B. C., during a recent visit there, our old friend R. F. Pollard. Mr. Pollard is known in Chicago, New Orleans and the West, and is without doubt one of the most expert operators as well as a beautiful penman, the latter in which he excels.

Mr. Pollard is full of reminiscences and has a story to tell about every place in which he has worked for the past thirty-five years, and the number of these places is legion.

Everybody knew E. J. Davis, the tall, lanky night chief operator of the New Orleans office many years ago. Mr. Davis was quite a character and unique in personality as he was as an individual.

There was also an operator named Petrich working in the New Orleans office. Petrich was a good receiver but very lame on the sending side; in fact, in conversation over the wire his Morse was next to unreadable.

During one of the old timers' conventions Mr. Davis represented the New Orleans contingent. Wishing to get a little news from home he called up the New Orleans office and Petrich responded.

"I. I. 'P' N. O."

"This is E. J. Davis talking and I would like to know how you are getting along down there."

Petrich then began a series of dots and dashes never before recorded and absolutely unintelligible to Mr. Davis, who listened patiently and attentively but could not gather any information from Petrich's sending.

Petrich was trying to tell him that his (Petrich's) son had died the day after Davis left town, and he was dwelling at length upon various troubles of his own that had taken place since Davis left New Orleans.

Out of this entire jumble Davis could not extract one ray of intelligence, but not wishing to break or ask for a further explanation, he diplomatically remarked "Hi, Hi! glad to hear it, old boy, 73."

Mr. Davis never knew to the day of his death why it was that Petrich spoke to him only when absolutely necessary and only on business.

Both gentlemen are now inhabitants of the planet Mars and members of the Pleiades Club, and when they read this little story, which will be published in the Pleiades "Banner of Light," Ed. Davis will understand why Petrich never spoke as he passed by.

Personals.

W. R. Powell, a well-known operator, is manager for the Federal Telegraph Company at Seattle, Wash.

Jas. L. Gibb, a former gilt edge operator, well known in Colorado and on the Pacific Coast, made his fortune in Vancouver, B. C., in the boom days and is now retired from business.

J. B. L. Hickerson, a well-known old-timer, is now connected with the Washington-Alaska Cable System at Seattle, Wash., in an official capacity.

Homer Chaddock is one of the efficient members of the Western Union El Paso, Tex., force.

G. J. Verges, so well known in the South, is with the Postal Telegraph-Cable Company at New Orleans.

L. H. Dinkeldine is night chief for the Postal Telegraph-Cable Company at New Orleans.

C. F. Moriarty, one of the finest operators in Canada, is with the Victoria *Times* at Victoria, B. C.

L. S. Melsted, a well-known attorney of Seattle, Wash., loves to telegraph so well that he often puts in a pleasant evening working a wire in the Seattle office.

Frank H. Morris, son of John L. Morris, the latter so well known throughout the country, is chief operator for the Great North Western Telegraph Company at Vancouver, B. C.

We are indebted to C. H. Daniels, the genial manager of the Great North Western Telegraph Company at Vancouver, B. C., for courtesies extended.

Bert E. Starr, who went to British Columbia years ago, is working for the Canadian Government in the telegraph department in the Parliament building at Victoria, B. C.

Victoria, B. C., Canadian Pacific Railway Telegraphs.

The journey from Seattle to Victoria, up the Sound, was a most beautiful one, and the appearance of Victoria at night reminds one of an enchanted fairy land, particularly so as there were several inches of snow upon the ground on the occasion of our visit.

Victoria is the most historical city of the faraway Pacific Northwest, and was renowned very nearly a century ago as being the headquarters of the Hudson's Bay Company.

In the late 60's, Lieutenant Charles Beresford, of His Majesty's Service, was stationed in Victoria. Lieutenant Beresford was a great joker, and on St. Patrick's Day he had his milk white horse painted a beautiful green and attached him to a green colored buggy, he himself being dressed in a very pronounced green suit of clothes. The affair created quite a sensation at the time and is still mentioned by some of the old-timers of Victoria. As there is but one "New Orleans," there is but one "Victoria," each having its separate and distinct advantages.

It was very pleasant to meet Messrs. E. W. Clayton, manager, J. J. Jackson, chief operator, and W. N. Kennedy, assistant manager, all of whom vied with each other in trying to make our stay in their city a pleasant and profitable one.

Appended is the roster of the office: E. W. Clayton, agent; W. N. Kennedy, assistant agent; J. J. Jackson, chief operator; O. A. Anderson, night chief operator; A. Crowe, delivery clerk; Miss J. V. Hawkins, bookkeeper; Miss C. W. Powers, counter clerk.

Vancouver, B. C., Canadian Pacific Railway Telegraphs.

It is surprising to witness the patriotism, enthusiasm and loyalty expressed on every side in British Columbia when the present great struggle is mentioned. Even the messenger boys are filled with a desire to go to the front.

Superintendent R. N. Young, of the Canadian Pacific Telegraphs at Vancouver, has a son in the trenches, full of ardor and patriotism and ready to remain with his regiment till the end.

Wm. Dee, superintendent of the government lines at Victoria, has two sons at the front, the older one, Johnnie, having been shot almost to pieces, while young Willie is with his regiment at the front.

And this may be one of the reasons why the good people of British Columbia are ever ready with an open heart to assist each other or even an entire but worthy stranger.

Superintendent R. N. Young is one of the best telegraph men in Canada and the affairs of his district are conducted with wisdom.

Grant Colborne, chief clerk to the superintendent, is a young man raised in the business who has a brilliant future ahead of him. He possesses all the innate hospitality and gentleness found among the Canadians. Miss N. C. McHeffey is Mr. Colborne's stenographer.

Joel Weaver Baker is chief operator, and he is chief operator, too, in every way. Mr. Baker is one of the best-known telegraphers in the Dominion.

W. S. Jamieson is night chief and is a very able and courteous official.

R. F. Pollard has friends all over the country and is as widely known for his good qualities as he is for his fine penmanship.

W. J. Hearsch, so well and favorably known in San Francisco and other Pacific Coast cities, is on the staff of this company.

The office is a most pleasant one to work in and few die here and fewer still resign. The force consists of R. N. Young, superintendent; Grant Colborne, chief clerk, superintendent's office; A. J. Clark, agent; W. V. Walton, assistant agent; W. M. Downie, cashier; J. J. Jones, chief delivery clerk; F. Mackenzie, bookkeeper; H. B. McIntyre, telegraph inspector; F. Stevenson and J. A. Jopson, linemen; John Tait, telegraph inspector, Nelson, B. C.; Geo. Wady, telegraph inspector, Revelstoke; J. W. Baker, chief operator; J. J. Schetgen, wire chief; D. McLaren, traffic chief; W. F. Jamieson, night chief; W. A. DeCon, late night chief. Following is a list of the operators at Vancouver: A. W. McCleneghan, W. Calder, W. J. Hearsch, [illegible] S. Cooper, W. N. Nelson, C. A. Prushaw, J. F. Campbell, E. F. Johnson, T. O'Connor, L. H. Hall, G. L. Gauvreau, T. P. Masters, E. W. Parker, W. D. Brine, S. E. Hobart, H. Cunningham, J. W. McKinnon, J. B. Ross, M. J. Cummings, A. J. Tennant, J. W. Taft, L. M. McDaniels, E. F. Bailey, W. Savage, D. G. Mackenzie, R. F. Pollard, D. McLean, F. H. Cleveland, E. C. Leslie, J. Ross, Jr., J. T. Brooke, W. C. Boyle, A. Van Egmond, P. Conway, M. Hallisay, G. Upward.

Truth Will Prevail.

Alabama is a state of great resources. It is the home of many fine telegraph men and recently Mr. W. J. Lloyd, appreciating this fact, took up his residence on a beautiful plantation in that state.

Tom Kelly was a native of Whistler, Ala., where he became an operator, later transferring his services to New Orleans, where he was at one time temporarily made chief operator for the Western Union.

Mr. Kelly had a nimble wrist and his merry Morse sounded like firecrackers on a Chinese New Years, but he was certainly weak as a receiver. This fact Kelly tried to hide and resorted to many artifices to cover up his deficiency in this respect, but truth will not be smothered and there is nothing hidden which will not be uncovered.

So it occurred that Kelly sat down one evening to copy some red messages from Dallas. They were all "citys," but Tom could do better execution, in case of a rush, with a pencil than he could with pen and ink, and he accordingly copied all the messages in pencil, later taking them to his home, where he recopied them with ink.

Proudly he came to the office next morning just a few minutes before office hours and turned his work in, walking away with a 7 by 9 smile on his countenance.

Billy West was the manager of the New Orleans office at this time and when his delivery clerk reported to him that the twenty-five red messages in Tom Kelly's handwriting would not copy, the ink was examined and it was discovered that it was not the regulation Western Union copying ink but some cheap dope purchased from a convenient drug store.

Tom Kelly's secret was out and everybody laughed about it, although it was a matter of more or less exasperation to the manager.

Many participants in this little story have since climbed the golden stairs and they will no doubt smile when they read this episode in the "Banner of Light," published in Hesperian City—the home of the Pleiades Club.

LETTERS FROM OUR AGENTS.

New York Postal.

Phillip A. Hickey has been appointed manager of the Cotton Exchange office, vice John Costelloe, deceased. Prior to this appointment Mr. Hickey was manager at the office at 153 West Forty-second Street. Mr. Hickey formerly held the position of chief operator at the Cotton Exchange office.

G. J. O'Brien has been promoted from the position of chief operator in the Produce Exchange office, to that of manager at No. 153 West Forty-second Street. J. F. Shugrue has been appointed chief operator at the Produce Exchange office, vice Mr. O'Brien.

New York Western Union.

E. S. Brewster, the well-known Commercial News Department baseball operator and a renowned singer, has announced to his friends that he is shortly to join the benedicts.

The New York Western Union Educational Society is planning a dance to take place after Lent. The society has adopted an official pin which will be distributed to the members about the end of the month. The emblem consists of the Western Union seal with the words "Educational Society" on the outer circle. The pin has been adopted as the official badge of all of the educational societies in the Eastern Division.

Miss Virginia Manson and O. L. Matratt of Albany, N. Y., and Miss Mary Gunn and Peter Wobus, of Rochester, N. Y., are studying the multiplex equipment in this office preparatory to handling the apparatus soon to be installed connecting the two cities mentioned with New York.

The term "Rookies" is used in referring to the men in training to manage multiplex equipment. The abbreviation "Mux" is a well-established word now in common use in referring to the multiplex system. Other telegraphic expressions that have become national in character are "Sunflower," in referring to the Barclay printing telegraph system; "Mill" in referring to the typewriter, and "Bug" in referring to the sending machine.

Miss E. Vatet, the principal of the Morse school in this office, has just graduated her two hundredth telegraph student since her incumbency.

Philadelphia Postal.

The sleet storm and high winds of March 5 caused numerous scattering broken wires around Philadelphia and vicinity, but the prompt and effective response of the plant department prevented any serious service interruptions.

Miss E. G. Keys is among the new arrivals in the main operating room.

C. B. Massey, formerly manager of our Tenth and Chestnut streets branch, and recently with another company, has assumed charge of the newly organized telegraph department of the Union Petroleum Company in this city.

Miss Alice Tanseg has been appointed in charge of David Lupton & Co.'s private wire service.

J. B. McKeegan of the New York cable circuit has been placed in charge of the telegraph department of Brown Bros. & Co.

Operator S. Simms has been transferred from Wilmington, Del., to "B" branch office, Philadelphia.

Charles G. Miller, aged ninety-seven years, father of F. B. Miller and grandfather of chief operator E. W. Miller, died on March 7.

Among the recent visitors were Miss L. Williams, formerly manager at Pottsville, Pa., and Miss Thomas of the same city.

Manager J. Zecher of Atlantic City called recently to see his friends.

Chicago Western Union.

R. G. Swartout died Monday February 26. He was in the service for a long time. He was employed in the Illinois Division prior to his death. He had an excellent record for faithful attention to duty.

Theodore B. Irish died January 29 in the home for incurables.

Charleston, S. C., Western Union.

The employes of the commercial department held a "get-together" meeting at the Chamber of Commerce on the night of February 26. Mr. W. O. Gaffney, the recently appointed manager, delivered an interesting address on "Courtesy, Competence and Co-operation." At the conclusion of the address a collation was served. Among those present, besides manager Gaffney, were Mrs. Gaffney, E. D. House, assistant manager; W. J. Fleming, solicitor; H. W. Huges, chief operator; A. R. Lucas, wire chief, and Mrs. Lucas; E. Johnson, manager Charleston Hotel branch office; A. E. Anderson, W. J. McSweeney, Mrs. J. Mathewson, G. Moore, Mrs. J. Way, Irvin Ward, C. S. Cochran, Mrs. W. E. Whaley, Miss E. Oppenheimer, Miss L. Lafour-M. B. Belvin, Miss M. Burns and Mrs. B. L. Brock.

St. Louis Western Union.

In the evening of March 5, a banquet and meeting was held at the American Hotel Annex by the supervisors of traffic, and the testing and regulating attendants of the plant department in this office. Special arrangements were made for the night force to attend, and a very pleasant and instructive evening was spent in the exchange of ideas and suggestions for the good of the service. Papers were read by Arthur Mitchell, night chief operator on "The difference in day and night traffic handling, and the opportunities for advancement in supervising;" by O. R. Carson, giving various suggestions pertaining to testing and regulating work; E. L. Morris, dealing with the subject of "Accuracy;" F. P. Mullen, on "What constitutes a satisfactory multiplex supervisor;"

J. V. Steel "Educating and increasing the efficiency of younger multiplex operators"; P. D. Herron, "What can a well-organized testing and regulating force do to assist the operating department in the movement of traffic."

J. E. Dunlap, agent for the Telegraph and Telephone Life Insurance Association, left here March 11 for New York City, to attend the annual meeting of the association there on March 14.

Books.

Principles of the Telephone. By C. M. Jansky and D. C. Faber, 160 pages; 125 illustrations.

This book was prepared by the authors, who are professors of electrical engineering at the University of Wisconsin, in the extension division of that University, and, as the title indicates, deals with the principles of the telephone. It covers the following subjects: Elementary electrical principles; magnetic principles; sound; transmitters; receivers and induction coils; signaling apparatus and circuits; the subscriber's telephone set; local battery systems; common battery telephones; faults in substation telephone apparatus; protection of telephone lines and apparatus; installation; party lines; intercommunicating telephone systems.

The simplest of mathematics are employed in the text, and each chapter is concluded with a series of questions on the subject of the chapter.

The illustrations are excellent and show the details of construction of apparatus very clearly.

The work was designed to be of practical use to those who are actively engaged in the installation, care and operation of telephone apparatus. The main emphasis, however, is placed upon the principles of operation of different types or makes of subscribers' apparatus, together with a discussion of methods of locating faults and their correction.

The authors have in preparation two other books as part of the course, which will deal with central office equipment and outside construction.

This book will be of great service to the student as well as to the practical man. The price is $1.50 per copy.

Copies may be obtained from TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

First Principles of Electricity. By J. E. Homans. Price $1.00.

In this volume, which is in a class by itself, the author undertakes to treat of the principles of the electrical science from the ground up. He reviews all the matters necessary to constitute a fundamental knowledge of all forms of electric current, and is very lucid in his explanations of obscure points. Nothing is omitted and nothing is slighted that is necessary to give the student and reader a thorough grounding in the science.

The illustrations are very clear and easily understandable and altogether this volume certainly will be a great help to those who wish to learn the fundamental facts of electrical action and apparatus. Not only will it be useful to beginners but to advanced students as well, and also to practical electrical workers.

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NEW YORK, APRIL 1, 1917.

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High Cost of Newspaper Living.

"The high cost of living" is an expression very frequently used and heard by all of us these days, and in spite of all investigations, which are of no practical benefit, everyone is struggling with the hard conditions. High cost of living does not refer alone to what we wear and what goes into our stomachs. Everything that contributes toward the support and pleasures of life is included in the list and those who are not in a merchandizing or publishing business little realize the strain put upon the proprietors by the high prices.

Take newspapers for instance. Few readers stop to think of the difficulties met with by the publishers in their efforts to make both ends meet. In many cases the ends do not meet, and the gap between them is widening all the time.

One of the principal materials used by newspapers is printing paper and this is the one thing that has increased in price more than any other. In our own case we paid $336.00 for 100 reams of paper previous to one year ago; now it costs us $731.00—an increase of over 100%—and yet our readers are paying the old price for their subscriptions. Ink, press work, typesetting, wages, etc., have also greatly advanced in price, perhaps not to so great a degree, but in the aggregate these increased costs place a heavy burden on the publisher.

It is now almost out of the question to publish books, with the price of paper so high, and the result is the production of this class of literature has been very materially lessened. These are facts that are not apparent to readers because they do not see the bills, but they are very real to publishers. So when we talk about the high cost of living we should think of the other fellow who has his troubles too.

The Western Union Annual Report.

The annual report of the Western Union Telegraph Company for 1916 is a record of remarkable expansion and progress in the telegraph and is the best ever issued by the company.

In ten years the total income has nearly doubled, being, in round figures, $61,920,000 last year, against $32,856,000 in 1907, and the operating expenses $48,728,000 compared with $26,532,000 ten years ago.

The gross operating revenues last year increased 21 per cent. as compared with those of the year previous, and the operating expenses 18.9 per cent. The figures of last year are the highest reached by the company and no doubt they will continue to grow with the developments and improvements that are constantly being made in securing and handling business. It is safe to say now that there can be no limit to the growth of the telegraph business, although a few years ago it was often remarked that the telegraph had reached the limit of expansion. The introduction of modern business methods has proved the fallacy of this assertion, and we are all ready now to believe that there is no limit, and that the telegraph will continue to grow as long as it is controlled by men of intelligence and ability.

One of the most interesting things found in the report, apart from the excellent financial showing, is the reference to the multiplex. It is there recorded that the system has been extended during the year and is giving satisfactory results. The increased capacity given to the wires by the use of this apparatus has made it possible to handle the increased traffic in a satisfactory manner. Without this the company would certainly have been swamped. But it is the same in the telegraph as in any other line of business, when there is need for a thing it will be born at the proper time.

At the close of the year the company had 1,600,-

146 miles of wire, iron and copper, compared with 1,583,593 miles at the end of 1915. There was a decrease in the length of pole line, however, the figures for 1916 and 1915 being 208,474 and 209,854 respectively. To what this decrease is attributable the report does not state.

Three million eight hundred and ninety-six dollars represents the amount the company paid out on account of increases in salaries, including vacations, special payments last December, benefits, pensions, military service, etc. This does not include increases in payroll on account of enlarging the force. This is a big sum of money to pay out in this way but the wisdom of it has been amply justified in the form of increased business and greater union and cooperation between the operating forces and the management.

On the whole the report is quite as satisfactory to the employes as it is to the stockholders, and there is every reason to believe that the benefits to the former will increase as the business expands.

The Marconi Company's Report.

Notwithstanding the governmental restrictions placed upon wireless operation in this country the Marconi Wireless Telegraph Company of America continues to grow, as indicated by its annual report, just issued. The gross earnings from operation increased $91,753.10; general operating expenses increased $37,882.18 and net income increased $47,045.93. This is a satisfactory report for a company so young and working under such adverse conditions and it gives a fair indication of what might be expected of the company's operations were it allowed to do its work without hindrance.

Traffic with ships shows an increase and while it is a modest figure it is an increase, and that means a great deal. The company is well-managed indeed to do so well in the face of so many obstacles it has to contend with, but like the wire companies it has to fight to protect its rights and maintain its existence.

War Conference With Telegraph and Telephone Officials.

Messrs. Theo. N. Vail, president of the American Telephone and Telegraph Company; Newcomb Carlton, president of the Western Union Telegraph Company; Charles P. Bruch, vice-president of the Postal Telegraph-Cable Company; F. B. McKinnon, vice-president of the United States Independent Telephone Association, and N. C. Kingsbury, vice-president of the American Telephone and Telegraph Company, were in conference with war department officials at Washington on March 19 to perfect plans to insure government rapid and efficient wire communication in the event of war.

The delegation also conferred with Brigadier-General Kuhn, president of the Army War College; Brigadier-General G. O. Squier, chief of the army signal service, and Commander Todd, director of the navy radio.

Telegraph and Telephone Patents.

ISSUED FEBRUARY 27.

1,216,887. Inductive Wireless Telephone System for Railroads and the Like. To T. G. Thornblad, K. H. Warfvinge and V. G. Werner, Stockholm, Sweden.

1,217,255. Telephone System. To C. S. Winston, Chicago, Ill.

1,217,472. Telephone Exchange System. To J. L. McQuarrie, Oak Park, Ill.

1,217,477. Telephone Exchange Supervisory System. To T. G. Martin, Chicago, Ill.

1,217,483. Transmitting Apparatus for Wireless Telegraph Stations. To T. B. Miller, Seattle, Wash.

1,217,510. Telephone Trunking System. To M. Schwartz, Chicago, Ill.

1,217,516. Transmitting Apparatus for Wireless Telegraph Stations. To F. G. Simpson, Seattle, Wash.

1,217,517. Radio Telegraph and Telephone System. To F. G. Simpson, Chicago, Ill.

1,217,548. Telephone System. To C. Adams-Randall, Boston, Mass.

ISSUED MARCH 4.

1,218,035. Telegraph Sounder. To R. M. Allen, East Orange, N. J.

1,218,062. Electric Switch Suitable for Use in Telegraphy. To F. G. Creed, Croydon, England.

1,218,165. Telegraph Typewriter. To A. D. Cardwell, Brooklyn, N. Y.

1,218,182. Telephony. To D. S. Hulfish, Toronto, Ont., Can.

1,218,195. System for Transmitting Communications. To C. V. Logwood, New York.

1,218,274 and 1,218,413. Quadruplex Telegraphy. To I. Kitsee, Philadelphia, Pa.

ISSUED MARCH 11.

1,218,804. Selective Signaling System. To F. N. Reeves, Newark, N. J.

1,218,806. Telephone Trunking System. To J. G. Roberts, Dobbs Ferry, N. Y.

1,218,870. Duplexing Telegraphic Lines. To I. Kitsee, Philadelphia, Pa.

1,218,892. Muffler for Telephones. To A. Pludowski, Waterbury, Conn.

1,218,998. System for Packing and Shipping Telephone Apparatus. To A. M. Haubrich, Chicago, Ill.

1,219,215 and 1,219,216. System of Space Signaling. To J. C. Armor, Ingram, Pa.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on March 27:

American Tel. and Tel. Co.	127½
Mackay Companies	65-66
Mackay Companies, pfd.	86-88
Marconi Wireless Tel. Co. of Am. (Par value 5.00)	2¾
Western Union	96½

WESTERN UNION DIVIDEND INCREASED.—The Western Union Telegraph Company has declared a quarterly dividend of 1½ per cent. This is an increase of ¼ of 1 per cent. per quarter and places the stock of the company on a 6 per cent. basis.

To Increase Western Electric Capital.—A special meeting of the stockholders of the Western Electric Company will be held April 3 to vote on the proposed increase of capital stock from $15,000,000 to $30,000,000.

Foote, Pierson & Co., Incorporated.—The firm of Foote, Pierson & Company, New York, has been dissolved, by the retirement of Mr. George L. Foote. The business has been taken over and indebtedness assumed by a corporation entitled Foote, Pierson & Company, Inc., under which name the business will be continued at 160-162 Duane Street. Mr. H. G. Pierson has accepted the presidency, and Mr. Morris N. Liebman has been made vice-president, and will be in immediate charge of the company's works.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. Edward Reynolds, vice-president and general manager, left New York, Sunday, March 25, on a business trip that will take him to the Pacific Coast.

Mr. C. P. Bruch, vice-president of this company, and president of the Ohio Society of New York, made an interesting and patriotic address at the meeting of the society, March 12. His subject was the crisis in our national affairs, and he expressed himself strongly in favor of universal military training. Among those present were David Homer Bates and F. N. Dowler.

Mr. F. J. Kernan, auditor of this company, New York, returned to his office March 26, after an illness of several weeks.

Mr. Charles A. Richardson, superintendent of the fourth district, Eastern Division, Boston, Mass., who was transferred to New York as superintendent of the second district, as announced officially in our previous issue, was tendered a dinner on March 15 by the local managers of Boston when he was presented with a traveling bag. Mr. Richardson was identified with this company in Boston for seventeen years.

A New Copper Wire is being erected to provide additional telegraph facilities for Albany, Ga., also to extend the company's long distance telephone service to Atlanta. Mr. R. J. Cutliff is manager of the Albany office.

Managers Appointed.—J. F. Jackson at Morristown, Tenn.; T. J. Conley, Chester, Pa.

Magnetic Club Dinner.

The Spring dinner of the Magnetic Club will be held at the Hotel McAlpin, New York, Thursday evening, April 19. A programme of extraordinary interest will be prepared. The proceedings of the twenty-eighth annual meeting of the Magnetic Club, held in New York, January 11, have been issued in pamphlet form. It contains a complete list of the members of the club. Mr. Chas. C. Adams is president and Mr. Wm. B. Dunn, 253 Broadway, New York, is secretary.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Eight-Hour Day for Western Union Employes.

The executive committee of this company, at a meeting on March 27, authorized President Newcomb Carlton to make the following announcement:

"Effective May 1, 1917—Traffic and commercial department employes at functional main and functional branch offices will be paid on a basis of eight hours for a day's work.

"Effective as of the same date—Operators and such other employes at such non-functional offices as may be arranged will be paid on an eight-hour basis.

"Effective as of same date—Plant department, gang employes, and such others whose work admits of definite hours of duty, will be paid on an eight-hour basis."

This is said to be equal to an increase of about 12½ per cent.

Mr. J. C. Willever, vice-president in charge of commercial department, has returned from a business trip through the Western Division. He inspected the principal offices in that territory.

Mr. W. J. Fraser, district cable manager at Boston, Mass., has been retired on pension after fifty-eight years of continuous service.

Mr. J. Lister, supervisor at the Hammels, N. Y., cable station, has been appointed district cable manager at Boston, Mass., to succeed W. J. Fraser, retired.

Mr. L. C. McCormick, formerly manager of the Postal Telegraph-Cable Company at Detroit, Mich., has been appointed the head of the bookkeeping department of the Western Union Telegraph Company in the same city.

Conference of Ticker Inspectors.—Division, district and city ticker inspectors from the principal cities east of the Mississippi River attended a conference at 195 Broadway, New York, during the week, March 19-24, in charge of Mr. C. R. Tilghman, general supervisor of the ticker service, New York. A dinner and theatre party were given and several sight-seeing trips made. Inspection trips were made to the 16 Broad Street, and 24 Walker Street offices. Among those present were: Division Inspectors H. Schlaeppi, Chicago, and C. Gall, Atlanta, Ga.; district inspectors, V. Kieffer, Cincinnati, Ohio; C. E. Wilson, Pittsburgh, Pa.; L. Derrick, Philadelphia, Pa., and J. Connors, Detroit, Mich.; chief inspectors, G. Sell, Chicago, and I. Hawes, New York, and city inspectors, G. Patterson, Indianapolis, Ind.; B. L. Fincher, Atlanta, Ga.; T. Behan, Albany, N. Y., and B. McCleman, Minneapolis, Minn., and E. V. Phelps of the office of M. C. Allen, division plant superintendent, New York.

Watson D. Schram, aged eighty years, a well-known old-time telegrapher and at one time manager of the receiving and delivery departments at 145 Broadway, died in New York, March 27. Mr. Schram was born in Adams, N. Y., and began his telegraph career about 1853. In 1875 he became chief clerk to Superintendent J. C. Hinchman and afterward to Superintendent C. A. Tinker. He retired from active service a few years ago.

THE CABLE.

Captain W. G. S. de Carteret, commander of the cable steamer Lord Kelvin, stationed at Halifax, N. S., is recovering from the effects of an operation and will soon be able to resume his duties.

John F. Tait, an old time operator in the Western Union Cable service at North Sydney, N. S., died March 10.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to March 25, 1917, as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable), October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917; Island of San Miguel (Azores) March 11, 1917.

CANADIAN NOTES.

Mr. J. McMillan, manager of the Canadian Pacific Railway Company's Telegraphs, Montreal, was a New York business visitor on March 23.

GREAT NORTHWESTERN.

A meeting of managers of the second district was held January 29 by Superintendent L. S. Humes at Montreal. Mr. G. D. Perry, general manager of the company, and other head office officials were present. An entertainment was provided by Superintendent Humes after the meeting.

The third annual meeting of the traffic department of this company was held February 22 and 23 in Toronto, and was a most interesting, instructive and pleasant gathering for all in attendance. A supper was given on February 22 at the Prince George Hotel, the table being decorated with a miniature telegraph line. On the table were placed an old time register, key, relay and sounder and printing apparatus to exemplify the progress in telegraphy. After the dinner there was a theatre party.

THE TELEPHONE.

Presentation of Medal to Dr. A. G. Bell.

Dr. Alexander Graham Bell, inventor of the telephone, was presented with the Civic Forum Medal of Honor for distinguished public service, at a meeting of the Civic Forum, at Carnegie Hall, New York, on the evening of March 21. There was a large audience of prominent men in literary, scientific, educational and business circles and telegrams were read from ex-Presidents Roosevelt and Taft, Theo. N. Vail, Dr. Charles D. Wolcott, and many others of national fame.

Addresses were made by Messrs. John J. Carty, Union N. Bethell, Thomas A. Watson, Rear Admiral Robert E. Peary, and others, to which Dr. Bell made a felicitous reply.

In his address Mr. Carty referred to Dr. Bell as "the man who with his telephone could mobilize the entire United States in twenty-four hours."

Mr. Bethell called attention to a prophecy made March 25, 1878, by Dr. Bell when he said that it was conceivable the day would soon come when, with the help of cables underground or wires overhead and running to shops, to houses, and all connected with a central office, men might carry on their business with their neighbors, or even talk back and forth to one another while in different cities.

In receiving the medal Dr. Bell made an address in which he said it embarrassed him to receive all the praise for the telephone when so much to advance its use had been perfected by those who came after him.

"I don't even understand the mechanism that Mr. Carty and his associates have developed," said Dr. Bell after explaining that he had no electrical knowledge when he began to perfect the first telephone. "I don't understand to-night how a man can talk in Arlington, across the river from Washington, and a man on the Eiffel Tower in Paris hears him. I don't understand how a man in Honolulu can hear what the man in Arlington is saying, with no wires connecting the Honolulu man and the sender beside whom I've stood at Arlington.

"I dare admit I blazed the way, but the great discoveries and developments that followed called for the correlation of many minds. I now realize I never would have invented the telephone if I had been an electrician. (Laughter). I mean it. What electrician would have been so foolish as to try any such thing?

"The advantage I had was that sound had been the study of my life—the study of vibrations; and I knew that if by electric current these vibrations could be carried I'd have my telephone. But if I'd been an electrician I would have said to myself, 'That can't be done' and I shouldn't even have attempted it.'"

Mr. N. C. Kingsbury, vice-president of the American Telephone and Telegraph Company, has been elected a director of the American Sugar Refining Company.

Mr. S. H. Riker, district plant chief, American Telephone and Telegraph Company, Troy, N. Y., has been transferred to the plant department of the same company with headquarters at 195 Broadway, New York.

Telephone Stations, Wire Mileage and Connections.—According to the annual report of the Bell telephone system, the number of telephone stations on December 31, 1916, was 9,847,192, an increase during the year of 695,971, of which 577,380 were owned by the Bell companies, 118,591 were Bell connected stations. The total mileage of wire for exchange and toll service was 19,850,315 miles, an increase of 1,344,770. Fifty-eight per cent. of the wire mileage is underground, and 2,682,910 miles were toll wire. The number of daily telephone connections increased to an average of 29,420,000, or at the rate of 9,789,700,000 a year, which is approximately 100 calls for every man, woman and child in the United States.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager of the Marconi Wireless Telegraph Company of America, New York, attended the luncheon of the members council of the Merchants Association of New York at the Hotel Astor, March 27. He was accompanied by nine Marconi officials. Governor Whitman and Mr. Bascom Little were the speakers. Mr. Little is chairman of the committee on National Defense of the United States Chamber of Commerce.

Mr. C. H. Taylor, engineer, Transoceanic Division of the Marconi Wireless Telegraph Company of America, arrived in New York on the "Carmania" March 12.

Mr. Arthur A. Isbell of San Francisco, who has been in New York for several weeks, has returned home to take up his new duties as division engineer of the Pacific Division of the Marconi Wireless Telegraph Company of America, with headquarters at San Francisco.

The Marconi School of Instruction at New York, under the direction of Mr. E. E. Bucher, is holding day and night sessions with eighty-five men enrolled, and a large waiting list.

The Marconi factory at Aldene, N. J. is working day and night on large rush orders for the United States Government.

On Friday evening March 23, Mr. Sy Briant, the well-known New York singer and banjoist, gave an entertainment over the wireless telephone at the DeForest Radio Station, Highbridge, N. Y. This station has been giving nightly concerts by means of a phonograph since November 1 last with the exception of Wednesday and Sunday nights. Friday evening's performance, however, was exceptional and was longer than usual. Mr. Briant has the honor of being the first to give an entertainment by radio telephony. The Princeton Club, New York, had the pleasure of listening to the selections through arrangements made by the DeForest Radio Company. The wonderful feat of wireless telephony has been made possible by the DeForest oscillion radio telephone. The sounds of the music were distinctly heard within a radius of seven hundred miles.

WOMEN RADIO OPERATORS.—The use of women radio operators to manage shore stations which will be operated by the Navy Department is, it is said, contemplated by naval officials. For this purpose thirty-five women operators have already volunteered their services.

Wireless Instruction for Women.

A wireless class for women has been formed at Hunter College, New York, under the auspices of the Nation League for woman's service, of which Mrs. H. S. Owen is the state chairman for wireless. The Marconi Company which is cooperating with the League is represented on the advisory board, by Mr. E. J. Nally and has contributed sufficient apparatus to completely equip the class, consisting of a 2-k. w. 240-cycle rotary synchronous marine set, with telephones, headpieces, buzzers and keys. Twenty-three women are enrolled under the instruction of Otto Redfern, of the United States radio inspection service, attached to the port of New York. He is a most competent man, having been formerly manager of the Marconi station at Duluth, Minn., and his wife is an expert wireless operator. The Department of Commerce will license any woman operator who qualifies. Mr. Nally's associates on the advisory board are: Prof. M. I. Pupin of Columbia University, Dr. A. N. Goldsmith of the College of the City of New York, Prof. Hill of Hunter College and Mr. Gano Dunn, president of the J. G. White Engineering Corporation, New York, which firm has constructed all the high-power stations for the Marconi Company Weekly lectures will be delivered by Mr. David Sarnoff, commercial manager of the Marconi Company, who is an expert operator and thoroughly equipped along technical lines.

Annual Report of Marconi Company.

The annual report of the directors of the Marconi Wireless Telegraph Company of America for 1916, just issued, shows operations for the fiscal year, before allowing for reserves, a net income of $336,040.59, as compared with $288,994.66 for the year 1915.

Receipts for message traffic with ships show an increase for the year of nine per cent. over the previous year.

The company continues to manufacture apparatus for use by the U. S. Army and Navy, and recently has been awarded contracts for a large number of wireless sets of various types.

The litigation involving the vacuum valve detector, invented and patented by Professor Fleming, of London, which patent is owned by this company, has resulted in a decision of the United States District Court; the patent has been sustained and found to be infringed by valves such as the modified form known under the trade name "Audion." An appeal has been taken by the defendant.

The Marconi patent, sustained by Judge Veeder in 1914, is again involved in litigation with the Atlantic Communication Company, and the company awaits an opportunity to examine Mr. Marconi as a witness in its behalf.

This same Marconi patent is in litigation, on the Pacific Coast, where an effort was made, at Seattle, to include a modified form of transmitting apparatus made and sold by Kilbourne & Clark, the defendants. The district judge in Seattle has been unwilling to include this modified form of transmitting apparatus as being within the sustained claims, and the company is appealing the case to the Circuit Court of Appeals.

Under United States Statute of June 25, 1910, the company is entitled to make claim for damages due to the appropriation of its patented property, by the United States Government. Availing itself of its right, the company began suit in the Court of Claims of the United States, in July, 1916, to recover its damages for the infringement of the patents of Lodge, Marconi and Fleming.

The extent of the rights obtained by rival bidders for government work under this statute of 1910, has been the subject of litigation. The U. S. District Court, Southern District of New York, construed the statute to authorize the making and selling by one Simon, a rival, unlicensed bidder for such work, and the Circuit Court of Appeals, Second Circuit, approved the decision. The Marconi Company promptly applied to the Supreme Court of the United States for a writ of certiorari, which was promptly granted, and it has, further, asked that court to advance the case on its calendar.

COMPARATIVE SUMMARY OF OPERATION
FOR 1915 AND 1916

	1915	1916
Gross Earnings from Operations..	$748,238.03	$862,501.55
Less Royalties	43,700.74	66,211.16
Deduct:	$704,537.29	$796,290.39
General Operating and Administration Expenses (Less Royalties)	520,475.60	558,357.78
Net Earnings from Operations	$184,061.69	$237,932.61
Add:		
Income from Investment of Surplus Funds	104,932.97	98,107.98
Deduct:	$288,994.66	$336,040.59
Reserves:		
For Depreciation of Coast and Ship Stations	54,178.15	23,459.64
Against Expiration of Patents.	50,000.00	50,000.00
Miscellaneous	7,500.00	2,692.15
	$111,678.15	$76,151.79
Net Income for Year After Charging Reserves, Carried to Balance Sheet	$177,316.51	$259,888.80

Recognizing the loyal service given by the employes of the company, the directors decided to extend to all employes, the benefit of life insurance, and accordingly, the company has arranged for policies for $500 for all employes who have been in the service of the company for one year and less than five years, and for $1,000 for all employes who have been in the service of the company for five years or longer, these amounts being payable to the beneficiaries designated by the employes in the event of death. In the same manner, accident insurance in the sum of $500 has been provided for all ship operators who have been in the service of the company for less than one year.

Reference is made to placing the officials and staff of the company at the disposal of the government in the event of national emergency.

The income from investment of surplus funds, amounting to $98,107.98, decreased $6,824.99 in 1916 in comparison with 1915, due to the fact that $8,961.48 interest was received on stock subscriptions during 1916, while in 1915 $17,922.96 was obtained. This reduction is explained by the fact that the stock previously subscribed for but not issued was, during the year 1916, taken up.

After setting aside all reserves, the net profit for the year amounted to $259,888.80, or an increase of 46.56 per cent. over the profits for the previous year. This amount has been added to the Surplus, increasing that account to $801,776.32 at December 31, 1916, and the reserve set aside at that date against depreciation amounts to $439,716.63 additional.

Talking Moving Pictures.

The Radio Talking Picture Corporation and also the Wireless Talking and Motion Picture Corporation have been incorporated in New York by Messrs. William H. Baker, William B. Vansize and Roy A. Weagant. The two corporations are said to own a "pioneer patent," just issued by the United States, and applications for further details and improvements covering and controlling broadly the coincident making of a photographic record and sound record and the reproduction of the same; in other words, the synchronizing of the transmission record and reproduction of the action and the corelated utterance of an animate, moving object, like the movements and speech of an actor or actress. The devices used permit perfect freedom of movement and action. This is accomplished by employing wireless telephone signaling methods and apparatus and this wireless link between the actor and recording and reproducing apparatus is the exclusive property of the companies named.

The three men who have formed this corporation to exploit and promote the commercial adaptation of this invention are well-known for their ability and knowledge of the electrical, telegraph, telephone and wireless business.

Mr. Baker is one of the most widely known officials of the telegraph and telephone service, having been many years connected with the Postal Telegraph-Cable Company, the Amercan Bell Telephone Company and the Western Union Telegraph Company and other electrical corporations; Mr. Vansize is an electrical and patent expert of long experience with the leading electrical corporations in the United States and Mr. Weagant is a specialist in radio transmission.

It is said that there is nothing involved in the apparatus to be used that presents problems not heretofore solved, but the adaptation to commercial use requires some detail experimentation, working out and demonstration.

The invention records both the sound and the picture at the same time, the picture being photographed on the film in the usual manner and the sound transmitted by radio or wireless to a recording device, making a lasting magnetic-electrical record which, like the photographic film negative, can be used to make as many duplicates as may be desired.

The picture-film reels and sound-record reels will be placed in the operator's box in the rear of the auditorium and the picture reproduced in the usual manner on a screen on the stage, and the sound record being simultaneously reproduced and rendered clearly audible by loud speaking telephones distributed throughout the auditorium, as may be desired, two or more being used, according to the size and arrangement of the auditorium. The speaking, singing, music or other sounds incidental to the picture accompanying the production are reproduced with absolute fidelity, naturalness and ample volume of sound.

Annual Report of Western Union Telegraph Company.

The annual report of the Western Union Telegraph Company for the year 1916 shows that the volume of business during the year was the largest in the history of the company.

INCOME ACCOUNT.			Increase over 1915	% of increase
Gross Operating Revenues.......		$61,919,140.52	$10,747,345	21.0
Deduct:				
Operating Expenses, including Repairs, Reserved for Depreciation, Rent for Lease of Plants, Taxes, etc.		48,727,921.07	7,755,380	18.9
Balance		$13,191,219.45		
Add:				
Income from Loans and Investments		1,702,460.09	398,534	30.6
		$14,893,679.54		
Deduct:				
Interest on Bonds of The Western Union Telegraph Company.....		1,331,850.00	3,738*	.3*
		$13,561,829.54		
Deduct:				
Amount of Single Special Payment to Employes to Dec. 31, 1916; authorized by the Board of Directors, Dec. 5, 1916.........		1,166,424.50		
Balance transferred to Surplus Account		$12,395.405.04	2,227,814	21.9
SURPLUS ACCOUNT.				
Surplus at Dec. 31, 1915.........		$18,882,968.53		
Add:				
Balance from Income Account for year ended Dec. 31, 1916	$12,395,405.04			
Adjustments of Surplus (net)	274,261.77	12,669,666.81		
		$31,552,635.34		
Deduct:				
Amount transferred to Reserve for Maintenance of Cables as representing Depreciation accrued on Ocean Cable Plant prior to Dec. 31, 1915	$ 1,000,000.00			
Dividends paid and declared	5,984,566.75		998,203	20.0
		6,984,566.75		
Surplus at Dec. 31, 1916, as per Balance Sheet		$24,568,068.59	5,685,100	30.1

*Decrease.

The considerable increase in operating expenses is due not only to the well known cause of material prices and a general increase in taxes, but to large increases in salaries and wages. The following is a summary of actual disbursements to employes in the year 1916 in excess of 1915, exclusive of increases in payroll on account of enlarging the force, viz.:

Increases in salaries and wages, including vacations under plan effective January 1, 1916......................	$2,614,000
Special payment to employes in December, 1916	1,166,000
Increase in total disbursed for benefits, pensions, military service, etc........	116,000
Total	$3,896,000

Under authority of the Board of Directors, says President Newcomb Carlton, there was disbursed in a single special payment to each regular employe receiving compensation at the rate of $2,000 or less per annum and who had been continuously in the service since January 1, 1916, excepting such cable employes as received special payments during the year, the following:

All messengers at independent offices, a flat sum of $25 each.

Employes receiving wages less than $1,200 per annum, 7% of annual wage.

Employes receiving wages from $1,200 to $2,000 per annum, both inclusive, 6% of annual wage.

Practically the entire special payment referred to was made before the close of the year.

Amounts paid to employes during the year in conformity with the domestic and foreign employes' benefit plans aggregated $648,614. At December 31, 1916, there were 573 pensioners on the roll. An actuarial study is being conducted into the operations of the employes' benefit plan with a view of ascertaining what may be expected in the future in respect to the annually increasing amount paid for benefits.

Adjustments of surplus (net) of $274,261 cover transactions relating to prior fiscal years.

There were 18,610 stockholders at the close of 1916, a decrease since last year of six stockholders; of the total number, 12,046 held twenty-five shares or less, and 16,690 held 100 shares or less.

The installation of the automatic printing telegraph system, known as the multiplex, referred to in the annual reports of 1914 and 1915, has been continued with satisfactory results. The extended use of this method of operation has greatly increased the capacity of the telegraph plant and has made possible the generally satisfactory handling of the increased traffic. Despite difficulties in obtaining material, the work of reconstructing lines and offices has steadily advanced and substantial progress has been made in the standardization of the company's offices, both as to their external appearance and their internal arrangements and appointments.

The physical inventory of the company's property, which is being made by the Interstate Commerce Commission, is approximately half completed, but no appraisals have yet been announced. It is expected that this work will be finished in 1920 at a cost to the Western Union Company of $1,000,000, as estimated in the report for the year 1914.

To afford employes additional opportunies to perfect themselves in the telegraph business, the company has prepared the texts of educational courses covering the three departments, Commercial, Traffic and Plant, and arranged with a correspondence school to conduct the courses at reasonable rates, the company advancing the fees in meritorious cases, without interest, to employes desiring to avail themselves of these arrangements.

Net additions and betterments to plant and equipment during the year amounted to $3,060,705. On December 31, 1916, there were 208,474 miles of pole line, 936,214 miles of iron wire, 663,932 miles of copper wire, 2,988 miles of land line cables, and 22,728 nautical miles of ocean cables. The operated offices were 25,234 in number, an increase of 92 offices since last year.

How an Improperly Adjusted Sending "Bug" Shatters the Common Side Signals.

BY E. C. SMITH, WIRE CHIEF, SOUTHERN PACIFIC TELEGRAPH DEPARTMENT, SAN FRANCISCO.

When an operator is sending on the polar side of a quadruplex with a sending "bug" which is adjusted so that it vibrates dots at a very high rate of speed, it interferes with the signals coming in on the common side (neutral relay) at the distant office.

It is not because the pole changer is being worked at too high a rate of words per minute, but because the dots are being made too rapidly and "chippy" for it. What is gained by a string of fast dots, under this abnormal adjustment of the "bug" is lost in the space following them, consequently there has been no saving in time.

As measured by hand sending, the dots are sometimes made two or three times as fast as they should be for the dashes which they accompany.

It is often the case that an operator will send a certain number of messages per hour with his "bug" adjusted for high speed, break himself every few words and cause frequent breaks on the common side; while another will send the same number or more, break himself but a few times and not cause the men working on the common side to break.

The reason is that the one with the abnormally adjusted "bug" cannot handle it as well and has to make proportionally longer spaces because his hand and mind are not capable of maintaining the speed for which his "bug" is adjusted; while the one with the properly adjusted "bug" will glide along with only enough speed to make his sending plain and easy.

The properly adjusted "bug," causing signals to go out which are more like hand sending, does not interfere with the common side.

From the time the armature of a pole changer leaves a closed position and arrives at an open position, and from the time it leaves an open position to the time it arrives at a closed position, there is no battery going to the main line. This is the moment of no magnetism. Ordinarily this is a "break-over," so called, and is overcome, as much as possible, by the repeating sounder arrangement (called the Edison "bug-catcher") between the neutral relay armature and the reading sounder, and the third coil to the neutral relay, which is discharged into by a condenser at the critical moment. The duty of these accessories is to catch the "bug" caused by the moment of no magnetism in the line at the instant the armature is traveling from one point to the other.

A so-called "break-over" is caused by the points of the pole changer being too far apart, thus causing a long moment of no magnetism to the line, and is caused every time the armature of the pole changer is opened or closed. even though it is opened or closed slowly: while a sending "bug" speeded up too high shatters or kills the signals coming in on the common side only when the pole changer is worked too rapidly.

A sending "bug" which vibrates too quickly shatters the signals coming in on the neutral relay at the distant station because of the fact that the dots are so short and "chippy" that there is not enough magnetism passing through the coils of that relay. In other words, the moments of magnetism are so short that their aggregate strength is not enough to overcome the pull of the retractile spring attached to the armature.

It is true that the number of moments of no magnetism are increased proportionately with the number of moments of magnetism, but the trouble is due to the fact that the length of the moments of magnetism are decreased in proportion to the speed of the dots, while, as far as the sending "bug" or key is concerned, the moments of no magnetism remain stationary regardless of the speed. In other words, the faster the dots the shorter the moments of magnetism passing through the coils of the neutral relay.

This is due to the fact that the speed with which the armature of the neutral relay moves from an open to a closed position is regulated entirely by the magnets of the pole changer, and the speed with which it moves back to an open position is governed by the retractile spring (and assisting magnets if it is a "3-B" pole changer).

The armature cannot be made to move any faster by speeding up the sending "bug," as many would like to do or imagine they are doing.

From this we gather that speed is maintained only by decreasing the length of the moments of magnetism without a proportionate decrease in the length of the moments of no magnetism. The result of this is that if a letter or figure is being made on the common side at the instant a fast and "chippy" string of dots are being made on the polar side, the moments of magnetism, which are governed by length of the dots, are too short and as a consequence the intended signal is not registered on the neutral relay.

Pole changers should be adjusted so that there is very little play of the armature between the contact points. The closer they are the shorter the moments of no magnetism and the greater the speed that can be maintained by "bug" or hand sending without interfering with the common side signals.

The best adjustment for the neutral relay, in order to render it the least susceptible to the "break-overs" from widely open points on pole changers and the shattering of signals caused by short moments of magnetism, is to pull the magnets as far away from the armature as it will stand and to make the retractile spring proportionately loose, so that the signals tend to drag.

The farther away the magnets are and the looser the retractile spring is, the slower is the pull toward the back stop of the relay when there is no magnetism in the magnets. This slow movement of the armature toward an open position gives the set more of an opportunity to restore itself to normal conditions before the relay has broken over or shattered the incoming signal.

It can readily be seen that if, under this adjustment, the magnets are demagnetized, that the armature would return to an open position more slowly than if it was adjusted more like an ordinary Morse relay, which is usually adjusted for a more snappy movement of the armature. All the more reason why it should be slow to open and go all the way across the gap between the purposely wide open points of the neutral relay when only a portion of the magnetism has been withdrawn, as in the case of a string of fast dots being made on the distant pole changer.

Perhaps this adjustment of the neutral relay, made necessary in order to overcome the conditions named, is one, if not the principal reason, why the common side is naturally slower than the polar side.

We experience the most difficulty of this nature on our Houston circuit, perhaps because of its length and because its common side is used a great deal, all the way between San Francisco and Houston.

The circuit runs from San Francisco to Houston, Tex., a distance of 2,124 miles. The polar side is used almost exclusively by and between these two points, while the common side is cut at Los Angeles and El Paso, thus dividing it into three sections, all of which are used a great deal of the time, independently of each other and simultaneously.

For those interested, following is a list of the repeater stations on this circuit, showing the distances between them: San Francisco-Los Angeles, 484 miles (common side cut); Tucson, Ariz., 500 miles (common side repeatered); El Paso, Tex., 312 miles (common side cut; terminus of Southern Pacific System); San Antonio, Tex., 619 miles; Houston, Tex., 209 miles. Total, 2,124 miles.

Chicago Board of Trade Office Forty Years Ago.

BY STEVE L. ROBINSON, PETOSKEY, MICH.

In a letter from my old friend, John Q. Mason, of Tacoma, Wash., he says: It would be fine if we boys of long ago could gather once again around the festive board and retail a few yarns.

In mind, I was carried back forty years, when as manager of "Ex" Western Union, Chicago Board of Trade office, John Q., with fifteen or more stars, composed a little family that for fast and exacting work had no peers. In fact at one end of the wires in "Ex" and at the other ends no drones or scrubs could stand the pressure, for our business was all rush. With knights of the key like Johnny Lapie and Harvey Reynolds at Buffalo dock, Emil M. Shape at Milwaukee and others, whose names I cannot now recall, at New York, Philadelphia, Baltimore, Cleveland, Detroit, Cincinnati, St. Louis and other points, all top-notchers, our end had to be good. Had I a photograph of my old associates in "Ex" in the seventies money could not buy it.

Of those still living, I can locate only J. Q. Mason, at Tacoma, Wash., and Dave Anderson (retired), at Chicago. Of the others, Fred Swaine, G. C. Maynard, W. M. Springer, Dug Burnett, J. E. Pettit, E. P. Whitford, Steve Mason, Chas. Lithgow, Rudd, Clem Green, Fred Angell, Gib. Merrill, G. M. Eitemiller, C. C. Robinson, Al. Baker, Al. Babb, Ed. Smith, John Strong, C. D. Meserve, and still others of like caliber, are all entitled to have their names stamped on the walls of fame as models, that the present generation of telegraphers need not blush to pattern after.

The past thirty years has brought into use many improvements that now remove obstacles we then had not learned to successfully contend with, but the spirit, the inborn moral force that made every one strive to get a message through—"no give-up"—cannot be improved on. As I visit the Board of Trade when in Chicago and see almost an army of men in the present "Ex" office, then note the comparison with what it used to be, when Jim Pettit, Dave Anderson and myself, the operating force, with Frank Richards, receiving clerk, the past seems almost a dream. The winter after the Chicago fire our office in a thrown-together frame building at Washington street and the River was so cold that many a morning the first thing we had to do was to thaw out our local batteries, then the ink-stands, and work with overcoats and gloves on. To many this may be considered but my fancy, but it was true.

In 1882 while manager of the Mutual Union Telegraph Company in Chicago, I entered into a contract with Mr. Melville E. Stone, now general manager of the Associated Press, New York, but then editor of the Chicago *Daily News* to run a loop from our office to the *News* office over which the paper could receive its special dispatches direct instead of by messengers. This was the first time that a Chicago paper was able to receive its news direct, but the custom is now general. I also made contracts wtih the *Tribune, Times* and one or two commission houses, which was the beginning of what is now a matter of routine in telegraph existence.

The ranks of the old guard are very thin. In the name of the few still living, I ask the boys of today to forget our past mistakes. Our vision had not the width perhaps you now have. Think of us kindly, not merely as old fogy dreamers.

Should this article meet the eye of any of the old crowd still living, I ask them to correct any misstatement, for my memory is not as good as it once was. Also pardon me if any name has been overlooked, for, if so, it is due to the head, not the heart.

THE MESSENGER BOYS in one of the large southern cities recently witnessed the human fly, Harry H. Gardiner, scale the front wall of a twelve-story building without any apparent difficulty. Now some of the messengers are wondering why it is not possible for them to deliver telegrams by scaling the front walls of a building and climbing through the window of a customer's office, without bothering or waiting to take the elevator.

Mr. Chas. M. Holmes, formerly and for many years executive messenger at 195 Broadway, New York, now living in retirement, in renewing his subscription for another year writes under date of February 8: "With the thermometer down to zero, coal up to $18.00, the belligerents blowing our ships up, I mean down, half the states gone dry, cigars gone up, W. J. Bryan going around the country with a pigeon under his arm, my birthday two days off, Lincoln's four days off, Washington's fourteen days off. I don't see how you can expect me to be very hilarious."

Efficiency Engineering in the Telegraph Service

(Continued from page 139, March 16.)

In these days service is a lively topic among telegraph and telephone people. There are various kinds and qualities of service; some good, some poor, some indifferent and some excellent.

Good service means that everyone identified with a company must be alert. His actions must impress favorably the customers who entrust their business to the company he represents. A client must be made to feel that his investment in service was profitable or he will not again patronize the company that to his mind did not accomplish the task placed before it. Perhaps he desired to secure an order from a distant point. He had an opportunity to purchase goods at bargain prices. He was willing to share his profits with his prospective customer. Something went wrong with the service and the order never materialized. The service was at fault. Whatever it was concerned those in charge of the wires and it was their business to dig deep into the causes so that a repetition of the trouble could not occur again. A customer should be taken into the confidence of those in authority and the explanations given should be truthful, so that no blame could attach to anyone. Frequently customers take their grievances to those higher in authority than the local representatives. For this reason if no other it is important that the customer should have a truthful statement which can stand the scrutiny and investigation of those higher up.

An indifferent service is brought about by those in charge of an office permitting delays in the handling of telegrams from the moment a message is handed to the receiving clerk until it passes from view over the wires to its destination. The receiving clerk, after timing the message handed to him, stops to talk to someone for a few minutes before he records the message on his books. After the proper record is made he stops again for some reason or other before the message is placed in the tube for transmission to the operating department. The time the message was received was, say, 10 a. m. It reached the operating room at 10:15. It is what we would call an indifferent service. This is termed a happy-go-lucky method of running a business office and the customer who entrusts his telegrams to an individual of this character does so with considerable misgiving. He feels that the action of the receiving clerk is not indicative of snappy work and he naturally reasons that he will obtain the same quality of service until the message is beyond the influence of the station. It is the manager's duty to see that the receiving clerk, the delivery clerk and all those who have to do with the business office of the company transact their duties in a manner that will inspire confidence in the business men who may by chance visit the office in the transaction of their telegraph service. A customer will not entrust his money to a bank that is conducted on any other than business principles. This must be reflected on entering the front door of such an institution. It is just as important that a telegraph office reflect to those entering the front door the spirit of the up-to-date manager who can meet any business man on equal ground so far as good management is concerned.

A manager recently informed us that he canvassed a concern for a portion of its business. He had never received recognition from the concern during his three months' incumbency of the office. The manufacturer turned to the manager and stated that he was always willing to give a new man a trial and that he would make it his business to visit the telegraph office and look it over. "Look it over" rather startled the manager. He argued with himself that that meant a great deal. He returned to the office. He viewed it from the sidewalk. He concluded that from appearance it would stand the scrutiny of the average business man, no matter how particular he might be. The windows were clean, the signs were in their proper places and in good shape. He then entered the office and he stood at the door and criticised everything in view. The floor was clean, there were three paper baskets in their proper places, each one of them partly filled with old papers. The blanks, pens and ink were in their places and the counters were clean. The clerks were neat and possessed a business air that was inspiring. Everything appeared as tidy behind the counter as in front of it. The manager was satisfied. He was willing, yes, anxious, to have any of his customers call and "look him over." In due time the manufacturer visited the office, paid his respects to the manager, and stated that he would give the company a trial. He left five messages. Service was then demanded and it was up to the manager to furnish it. So far as his organization was concerned he was satisfied with the expedition given to the five telegrams which were routed to five different cities. Then the manager wondered what grade of service he would obtain at the five places. Would each one of those managers co-operate with him to render an efficient service and thus retain the manufacturer as a permanent customer? The delivery clerk was requested to report the arrival of the five answers. In the course of a half an hour three replies had been returned. One hour later another reply reached the office and three hours later the fifth reply reached the office. The manager concluded that the last message to be answered either indicated inefficiency at the distant point or the message was not answered promptly. On investigating the cause of the delay, to his chagrin he found that inefficiency was largely the cause of a four-hour service that ought to have been rendered in thirty minutes. The point to be drawn from this actual case is that every link in the chain of telegraph offices should be equally strong and efficient. The manufacturer based his conclusion on the quality of the service rendered by pointing to message No. 5, which as he stated came limping into his office four hours behind time.

The importance of expediting the service in all telegraph offices, whether large or small, must always be uppermost in the minds of those in charge.

A telegraph or telephone company is organized to render service, and the public demands service.

(To be continued)

Annual Meeting of Telegraph and Telephone Life Insurance Association.

The fiftieth regular annual meeting of the Telegraph and Telephone Life Insurance Association was held in the board room of the Western Union Telegraph Company, 195 Broadway, New York, March 14, and was well attended.

In the absence of President William H. Baker, Mr. T. E. Fleming opened the meeting. A few minutes later Vice-President Charles P. Bruch arrived and took charge of the proceedings.

Secretary M. J. O'Leary read the report of President Baker.

"You will note that the heavy death rate shown in previous reports continued during the year," said Mr. Baker, "and that in order to meet current expenses and death claims, it was necessary to expend the entire income received from asssssments and interest, as well as to borrow $1,440.84 from the reserve fund.

"Death claims amounting to $107,100 were paid during 1916, and claims aggregating $34,000 not yet due and not yet proven, are carried over to 1917.

"Among the deaths occurring during the year was that of a member who committed suicide after a membership of about one month. The circumstances surrounding this death would seem to indicate that self-destruction was premeditated. However, as there is no provision in your present bylaws respecting suicide, the claim was paid.

"To protect the Association against the payment of future claims of this character, your executive committee has prepared an amendment to the bylaws which will come before you at this meeting, and I recommend its adoption.

"As you are aware, the earnest efforts to increase the membership inaugurated in the preceding year were continued during 1916, and I am pleased to note that the total number of applications received, during the year were nearly double that received during 1915. And also that the improvement was specially marked in the closing months, and has since been maintained, resulting in a small net increase of the membership.

"It is, however, a matter of deep regret to have to record again a heavy lapse rate. Year after year a large number of young men, who have been interested sufficiently to acquire membership, do not continue long enough to demonstrate the value or merits of the association.

"Even if there was no personal benefit to be expected, the fraternal sentiment of lending a helping hand to the family of a deceased associate through the sad affliction caused by death and attendant expenses, should be sufficient reason and inducement to become a member of this Association and to contribute a mite toward such a worthy and beneficial fund.

"In this connection, inasmuch as our field is limited and restricted to employes of the telegraph and telephone industries, it has been suggested that provision be made to accept applications from wives, sons and daughters of members or others, who at any time have been engaged in the service.

"Under date October 31, 1916, an exhaustive examination, under direction of the Superintendent, State of New York Insurance Department, was made of the assets and liabilities of the association and report received showing net assets of $301,221.66 over all liabilities on file at that date."

Mr. Baker referred to the death of S. S. Garwood, vice-president of the Association; to the resignation of Mr. A. R. Brewer, as treasurer, and the appointment of Mr. Lewis Dresdner to succeed Mr. Brewer, and commended the agents, officers and members of the various committees for their services during the year.

The reports of the secretary, treasurer and auditing committee were then read.

They showed that the Association had on December 31, 1916, 4,242 members in the full grade, carrying $1,000 insurance, and 916 members in the half grade, carrying $500 insurance, and that assets were held amounting to $361,176.11, par value over all liabilities.

An amendment to Section XIII of the By-Laws was adopted. It authorizes the payment of claims in the usual manner, provided that death shall not have been caused by suicide, whether sane or insane at the time, within one year from date of admission to membership.

A resolution on the death of Vice-President S. S. Garwood was read and ordered spread upon the minutes.

The chairman (Mr. Bruch) on behalf of the executive committee, announced that the committee now has under consideration several plans for still further strengthening the association, and further safe-guarding the interests of the individual members, and that the committee expects to be able to submit these plans at the next annual meeting—or possibly sooner, at a special meeting to be called for the purpose—with definite recommendations as to changes that may be necessary in the constitution and by-laws to carry out the plans if the membership approves them.

Considerable discussion followed this announcement, Messrs. E. J. Nally, W. H. McKeldin, T. E. Fleming, P. J. Tierney and others taking part.

The election of officers resulted as follows:

President, William H. Baker; first vice-president, Charles P. Bruch; second vice-president, T. E. Fleming; secretary, M. J. O'Leary; treasurer, Lewis Dresdner.

Messrs. T. M. Brennan and J. F. Nathan were elected members of the Executive Committee for three years, and the present Auditing Committee was re-elected.

Members of advisory board were elected as follows: Messrs. C. H. Gaunt, Chicago; H. J. Pettengill, St. Louis; B. E. Sunny, Chicago; E. Reynolds, New York; W. T. Gentry, Atlanta, Ga.; A. L. Salt, New York; H. C. Worthen, Atlanta, Ga.; J. G. Blake, San Francisco; H. D. Reynolds, Buffalo, N. Y.; G. W. E. Atkins, New York, and T. W. Carroll, New York.

Chairman Bruch appointed Messrs. E. F. Howell and E. B. Pillsbury a committee to draft resolutions on the death of G. H. Usher, member of the advisory board.

A motion (by Mr. E. F. Howell) was adopted extending the thanks of the association to the officers, executive and other committees and the agents for their work during the past year, after which the meeting, at 6:10 p. m., adjourned.

The following were present:

Boston, Mass.—P. J. Farrell.

Chicago, Ill.—Edward F. Wach, C. A. Dortmund.

Memphis, Tenn.—J. P. Smulovitz.

New York—J. R. Beard, T. M. Brennan, C. P. Bruch, J. R. Brugler, J. W. Connelly, J. L. Carroll, G. B. De Sousa, Lewis Dresdner, J. W. English, E. H. Falls, W. N. Fashbaugh, F. E. Fitzgibbons, G. W. Fleming, T. E. Fleming, N. M. Giffen, E. F. Howell, L. Lemon, W. E. Lennon, H. T. Marks, C. H. Murphy, E. H. Murphy, E. T. Murphy, E. J. Nally, J. F. Nathan, M. J. O'Leary, W. E. Peirce, E. B. Pillsbury, D. Sarnoff, T. R. Taltavall, P. J. Tierney.

Philadelphia—C. E. Bagley, E. W. Miller.

St. Louis, Mo.—J. E. Dunlap.

Washington, D. C.—W. H. McKeldin.

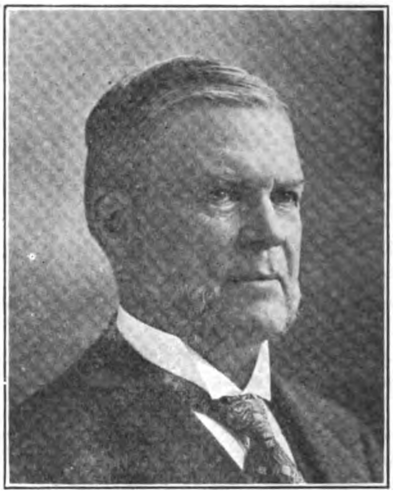
The Late C. A. Tinker.

In the death of Charles Almerin Tinker, who passed away at the home of his daughter, Mrs. Worthington C. Smith, at Winnipeg, Man., on March 12, as announced briefly on page 124 of our March 16 issue, the telegraph profession and the Society of the United States Military Telegraph Corps loses one of its valued and picturesque figures.

Mr. Tinker was born at Chelsea, Vt., January 8, 1838, and learned telegraphy at Northfield, Vt., in 1852. He became manager of the office three years later. He was operator in the Boston office from 1855 until 1856. In January, 1857, he went to Chicago and became an operator for the Illinois and Mississippi Telegraph Company. In October, 1861, he entered the United States Military Telegraph service as operator at the War Department in Washington, from which position he was detailed as operator in the Army of the Potomac and remained with it until McClellan retreated from the front of Richmond, when he was recalled and appointed chief operator and cipher operator at the War Department. He later became manager of the office and attended to the closing of the affairs of the military telegraph under the direction of Gen. T. T. Eckert, superintendent, and Gen. Rawlings, secretary of war.

Mr. Tinker was one of the "sacred three" cipher operators who were so closely associated with President Lincoln during the Civil War. The others were D. H. Bates and A. B. Chandler. Mr. Lincoln used to call on him to gain an insight into the mysteries of the wire, and to learn the latest news from the front.

In 1865 Mr. Tinker was appointed manager for the Western Union Telegraph Company for the District of Columbia. He resigned this position in 1872 to become superintendent of telegraph and chief train dispatcher for the Central Vermont Railroad Company at St. Albans, Vt., where he remained until November, 1875. He was later appointed general superintendent of the Central and Pacific Divisions of the Atlantic and Pacific Telegraph Company in which position he remained until that company was absorbed by the Western Union Telegraph Company. He was appointed superintendent of telegraph of the Baltimore and Ohio Railroad Company at Baltimore in January, 1879, and became one of the incorporators with Jay Gould and David Homer Bates of the American Union Telegraph Company, with which the Baltimore and Ohio Railroad Company became allied. He had charge of the American Union Company's affairs on the lines of the Baltimore and Ohio from Baltimore to Chicago, St. Louis, Mo., and Louisville, Ky. In 1881 when the American Union Telegraph Company was consolidated with the Western Union he became general superintendent of the Eastern Division of the latter company. He held this position until May 1, 1902, when he retired from active service.



THE LATE C. A. TINKER.

In speaking of his career in the military telegraph office at Washington, Mr. Tinker once said: "During the civil war I had the honor of meeting President Lincoln perhaps a thousand times, and had learned to look upon him in his daily and nightly visits almost as a companion, while we telegraph boys venerated him as a father."

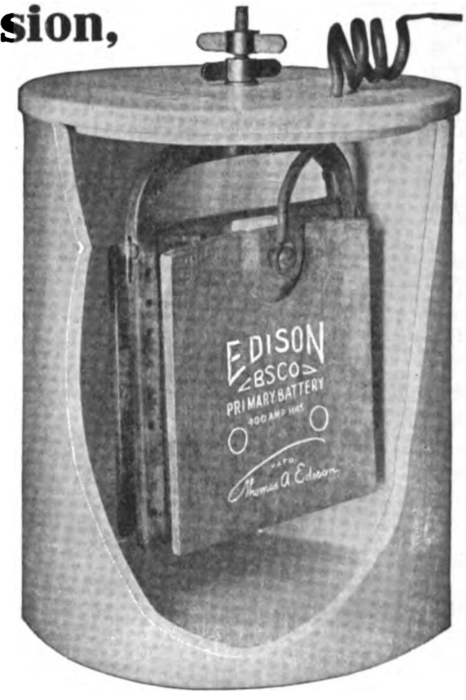
Impressive funeral services were held in Fairchild's Chapel, Brooklyn, N. Y., March 18.

Among those present were George G. Ward vice-president and general manager of the Commercial Cable Company; W. Gellatly, president V. C. Stanley, vice-president, and John Spader, of the Gamewell Fire Alarm Telegraph Company David Homer Bates, Albert B. Chandler, W. L. Ives, Verdie J. Knittle, C. W. Pearson, J. F. Ludwig, H. H. Atwater, J. B. Taltavall and many others besides representatives from the Lincoln Club of which Mr. Tinker was once president as well as a delegation of Masonic comrades.

Mr. Andrew Carnegie sent a letter of regret to Mr. David Homer Bates, secretary of the Society of the United States Military Telegraph Corps, and tributes were received from Col. William Bender Wilson, president, and Mr. W. R. Plum, historian of the Society.

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

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NEW YORK CHICAGO

THE RAILROAD.

Mr. N. E. Smith, superintendent of telegraph, New York, New Haven and Hartford Railroad Company, New Haven, Conn., is taking a needed rest in Florida.

Change of Southern Railway Telegraph Headquarters.—The headquarters of officials comprising the operating department of the Southern Railway, Lines East, were transferred from Washington, D. C., to Charlotte, N. C., on February 1. This called for the transfer of the office of superintendent of telegraph to Charlotte also, and this point will be the permanent headquarters of that official hereafter. Mr. J. A. Jones is superintendent of telegraph.

Western Division Meeting Postponed.—The meeting of the Western Division of the Association of Railway Telegraph Superintendents which was to have been held at the La Salle Hotel, Chicago, March 21, was postponed on account of disturbed business conditions throughout the country, particularly those facing the railroads. Mr. H. D. Teed, superintendent of telegraph of the 'Frisco Line, Springfield, Mo., is chairman of the western division.

The eastern members of the association had planned attending the meeting in Chicago and bringing before that body some important matters, and they expressed keen disappointment at the postponement. The postponed meeting will take place on April 19.

The Signal Engineers held their meeting in Chicago on March 21 as scheduled.

Mr. T. M. Schumacher recently elected president of the El Paso and Southwestern System, with headquarters at New York, began railroad work as a telegrapher and has had a wide experience in railway management. He is a native of Williamsport, Pa., where he was born February 16, 1862.

Eastern Division.—The proceedings of the meeting of the Eastern Division of the Association of Railway Telegraph Superintendents, which was held in New York, November 22, 1916, in pamphlet form, have been distributed. It is full of suggestions and ideas for the members and no doubt will be an aid to laying out future work for the association.

The Delany System of Secret Telegraphy.

This is a two-wire system operated by Morse key. The component impulses comprised in a letter are alternated between two wires, so that a message going from New York to Chicago, for example, could be sent over two routes, one wire touching Albany, Buffalo and Detroit, the other via Philadelphia, Pittsburgh and Cincinnati. The dot of letter "A" could go by the first route, the dash by the other, arriving at Chicago in proper sequence and recorded on a common receiver, Morse relay and sounder.

The use of the ordinary Morse key admits of regular standard Morse key transmission. This is accomplished by the employment of a rotary switch controlled by the key which puts the key in connection alternately, first with one wire and then the other, at each movement of the key.

This switch is operated electro-magnetically and imposes no extra work, attention or limitation of speed on the operator. In cases of great discrepancy in length or resistance between two wires, by use of an adjustable resistance in the shorter wire at the receiving end, the circuits may be readily equalized so that the receiving relay will respond to both circuits alike. Obviously two wires over the same route and on the same poles may be used, or two wires could be used through a suspected district and joined to a single wire for the rest of the distance.

With this system, tapping or overhearing would be impossible. No one could possibly have the slightest inkling of the import of a telegram, as every letter of two or more impulses is divided between the two circuits. As in letter "H," for example, the first and third dots would go over one circuit, the second and fourth over the other.

New York Telegraphers' Aid Society.—The following officers of the New York Telegraphers' Aid Society were elected at the annual meeting held at 24 Walker Street, New York, March 27: President, A. M. Lewis; vice-president, W. E. Rath; treasurer, T. M. Brennan; financial secretary, C. A. Kilfoyle; recording secretary, Mary E. Saunders. Executive Committee: E. F. Howell, E. J. Oakley, R. J. Marrin, J. L. Young. Auditors: F. J. Nurnberg, J. F. E. Hopkins, H. M. Heffner.

Following is financial statement of the Society for the year ended March 6:

Balance on hand March 6, 1916		$25,010.01
Receipts		6,154.95
Total		$31,164.96
Disbursements		
Death Benefits	$1,200.00	
Sick Benefits	3,335.00	
Expenses	881.48	5,416.48
Balance on hand March 6, 1917		25,748.48
Total		$31,164.96
RELIEF FUND		
Balance on hand March 6, 1916		$ 5,955.00
Receipts		1,258.08
Total		$ 7,213.08
Disbursements		$ 993.65
Balance on hand March 6, 1917		6,219.43
Total		$ 7,213.08

The regular fund gained $738.47 and the relief fund increased $264.43. There were twelve deaths during the past year, which was below the average of late. The year before there were twenty-one deaths, the highest number the Society ever had.

To be in harmony with the spirit of the telegraph every operator should subscribe to and read Telegraph and Telephone Age. Subscription price, $2.00 per year.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions following each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr. "Radiotelegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

THE CARE OF GRAVITY BATTERIES.

The amount of bluestone to be placed in the cell depends somewhat on the work required of the battery. For "local" batteries in which the sulphate of copper is rapidly consumed, about three pounds per cell are usually allotted. When this has been exhausted it may be assumed the cell requires cleansing.

For quadruplex circuits the "long" end of the battery need not be supplied with quite as must bluestone as the "short" end, since the former is not worked so continuously as the latter.

In some cases it is customary to put in a small supply of bluestone when the cell is set up and to renew the supply as required. This plan may prove satisfactory where very few cells are concerned, but in a battery room containing a large number of cells it will not answer, unless the staff of attendants is unusually large, too much time being required in the operation of replenishing. Another objection to this plan is that it appears to cause "caking" at the bottom of the cell.

The condition of a cell may generally be known by its appearance. In a cell in good order the solution is a bright blue color, the blue changing to water color before reaching the zinc. A very pale or a dirty brown-colored solution is indicative of a deteriorated condition of the cell. The average life of a local gravity battery is from four to six weeks. That of a main line battery, out of which three or more wires are supplied, about eight weeks, and a quadruplex battery from five to eight months.

A hydrometer is often recommended as a useful adjunct to a battery room, and it certainly is convenient to have one on hand when required. The function of the hydrometer as its name suggests, is to indicate the density, that is, the specific gravity of the solution of the cell. Knowing the point of density of the solution at which the cell gives the best working results, the information furnished by the hydrometer can be availed of to keep at the proper density point. But, again, these measurements require the attendant's time and would not, on that account, work altogether satisfactorily on a large scale. For general purposes, as already said, the appearance of a battery will indicate to an intelligent attendant the time for renewal. The tendency of the battery solution is, of course, to become more dense, and when it is desired to withdraw some of the solution to replace it with water a syringe is employed.

The hydrometer commonly used for the foregoing purpose consists of a glass bulb about an inch in diameter, to which is attached a narrow glass stem, five or six inches in length. A quantity of small shot is inserted in the bulb—sufficient to sink it to a desired depth in pure water. A scale somewhat similar to that of the ordinary thermometer is arranged on the stem. The scale is divided into 40 or 50 sections or degrees; zero being placed at the portion of the stem which is level with the surface of the water. As the density of the liquid is increased, the bulb and with it the stem rises; the density being indicated in degrees on the scale. An indicated density of 30 to 35 degrees on certain forms of battery hydrometers has been found to be about the maximum consistent with the satisfactory operation of the cell.

The utility of the use of oil on gravity batteries is questioned every now and again. This use of oil refers to the placing of a layer of oil on the liquid to prevent evaporation, etc. The objections generally offered to its use are that it makes the cell and the plates more difficult to clean; it cakes and falls to the bottom; it corrodes the insulation of the copper connecting wire; it does not prevent gathering of white salts on cell; it is dangerous as conducive to fires, etc.

The answer to these objections is that with proper precautions they need not be valid.

The cell in which the oil has been used, and also the plates, are readily freed of any oil that may adhere to them, by the application of moistened waste dipped in sand. Battery oil of the proper quality does not cake or flake. Ordinary oil is a solvent of rubber compounds, and, but to a less extent, of gutta-percha, and when these substances are used as the insulating material of the copper connecting wires, they are soon softened, especially if the oil employed has even a trace of naphtha. But a compound composed of gutta-percha and paraffin withstands the oil very well. Good oil certainly does prevent evaporation of the water of the solution, and the gathering of "white salts" on the jar. This has been proved repeatedly. When the salts have started to "climb" before the oil has been applied, they will continue to do so, but to a more limited extent. The oil should be applied when the cell is newly set up. *(To be continued)*

QUESTIONS IN TELEGRAPHY.

How much bluestone should be placed in each cell?

Why is the sulphate of copper (bluestone) solution in a cell more rapidly exhausted in a local battery than in a main line battery?

How can the condition of a cell be ascertained?

What is the average life of a local gravity battery, and of a main line battery?

What is a hydrometer and what is it used for?

What is oil used for in batteries?

What are the advantages in the use of oil and the disadvantages?

Telephony.

HOW THE TELEPHONE TALKS.

Sound is a vibration or series of waves in the air set up by a vibrating solid body. When these waves reach any other solid body, which is capable of vibration, they start it to vibrating in tune. For example, when a banjo string is plucked it vibrates back and forth, and being connected to the drum or parchment stretched over the frame of the banjo, the drum also vibrates. The large surface of the drum beating on the air sends out waves in all directions, just as a pebble dropped in still water sends out waves on the surface.

If a second banjo is placed near the first, the air waves beating upon the surface of its drum will start it to vibrating in tune with the first banjo. The musical note sounded depends upon the rapidity of the vibration, which in turn depends upon the length, weight and tightness of the string which was plucked.

In a similar way when one person speaks to another, a vibration is set up in the speaker's vocal organs, air waves issue from his mouth, and striking upon a tightly stretched membrane in the listener's ear, called the ear drum, set that into corresponding vibration. The vibration of the ear drum is conveyed to the listener's brain by the nerves, and there translated into what we feel as sound.

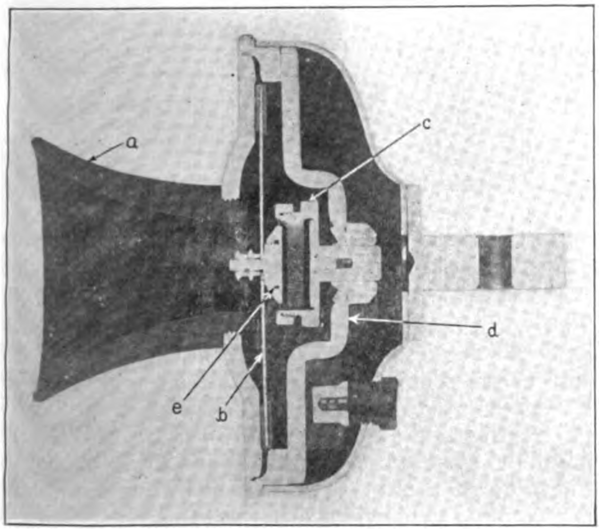

FIG. 1—TELEPHONE TRANSMITTER.

The sound of a voice will carry in air only a short distance, but electricity will travel hundreds or thousands of miles if guided over two wires. The telephone is an instrument for taking air waves, translating them into electrical waves, and then at the other end of the line translating them back into air waves just like the original. The telephone transmitter turns air waves into electrical waves, the telephone receiver turns the electrical waves back into air waves.

Fig. 1 shows a standard transmitter cut through the middle to show the internal parts. It consists essentially of three parts: the receiver of air waves, the transmitter of electrical waves, and the containing case holding the parts together and excluding dirt and moisture.

The sound receiving part is somewhat similar to the human ear. It consists of the conical mouthpiece (*a*), corresponding to the outer ear; and the diaphragm (*b*), which is a flat disc of thin metal clamped around the edge and free to vibrate in the middle, corresponding to the ear drum. Shown in cross-section, it appears as a thin vertical line.

The air waves from the speaker's mouth pass in through the mouthpiece and beat upon the surface of the diaphragm, setting it into vibration.

The transmitter of electrical waves consists of a small round box (*c*), like a pill box, partly filled with fine grains of hard carbon. This is known as the button.

As shown in the picture, the back of the button, or the pill box proper, is firmly attached to the frame (*d*) of the instrument, which is heavy and cannot vibrate. The front (*e*) of the button, or the pill box cover, is attached to the middle of the diaphragm and vibrates with it. This alternately presses the carbon granules together very slightly, and then relieves the pressure.

The two wires bringing in current from an electric battery are connected respectively to the front and back of the button, and the current must flow through the carbon granules. Now as the carbon is poured in loosely and the grains touch each other lightly, the electrical path is not a very good one, and therefore the current which flows is less than the battery would be capable of supporting were there a good solid connection.

If the diaphragm is pushed in to the right, however, the grains of carbon will be pressed together and the current will flow more freely. That is just what happens when one speaks into the mouthpiece; that is, the button cover moves rapidly in and out and the strength of the current varies correspondingly. Thus electrical waves are sent out over the wires.

The vibration of the diaphragm is very much less than one thousandth of an inch at most, and the rapidity of its vibration varies from about 200 movements per second to something like 3,000. It is marvelous that this simple, crude appearing little device, the carbon button, should be able to translate the sound waves into electrical waves so faithfully that when translated back into sound waves in a telephone receiver, perhaps hundreds of miles away, we are not only able to understand words, but even to recognize the voice of a friend; but such is the fact.

(To be continued)

QUESTIONS IN TELEPHONY.

What is sound, and how does one person hear the sound of another person's voice?

What is a telephone and what causes it to act?

How does a telephone compare with the human voice and human ear?

What are the essentials in the construction of a transmitter?

How do the carbon grains in the transmitter vary the current passing through them?

What is the measure of the vibration of a transmitter diaphragm and how many times does it vibrate per second?

Radio Telegraphy.

RADIATION OF ELECTROMAGNETIC WAVES.

These static and magnetic lines of force, moving with the velocity of light, sweep across the antenna at the receiving station. The vertical static lines in the wave are directed alternately upward and downward and produce in the antenna moving charges of alternately opposite signs; that is, an alternating current. At the same time the horizontal magnetic lines are directed alternately to the right and left, and when cutting across the antenna produce an alternating current in it. The resultant current generated by these two fields gives an alternating current in the receiving antenna quite similar to that in the transmitting antenna, although of course much weaker. It is these alternating currents which produce the signals in the receiving apparatus.

MEASUREMENT OF POTENTIAL BY SPARK DISCHARGE.

If large charges of opposite signs are given two insulated bodies close together, a spark will jump between them and the potential is said to be high. The distance between the points of two needles mounted in the same line may be used to measure this potential. The distance between two brass balls each two centimeters (about 25-32 inch) in diameter may also be used. It will be found that the needle points are more useful at low voltages, as from 5,000 to 15,000, and the brass balls more useful at the higher values. In Figs. 10 and 11 are given the voltage curves for the needle and the ball gaps. Thus, if the discharge occurs between needle points one-half of an inch apart the potential is 15,000 volts.

SYSTEMS OF UNITS.

Inductances and capacities are essential elements in the circuits for generating and detecting electromagnetic waves. Their definitions and the units in which they are measured will be briefly given later.

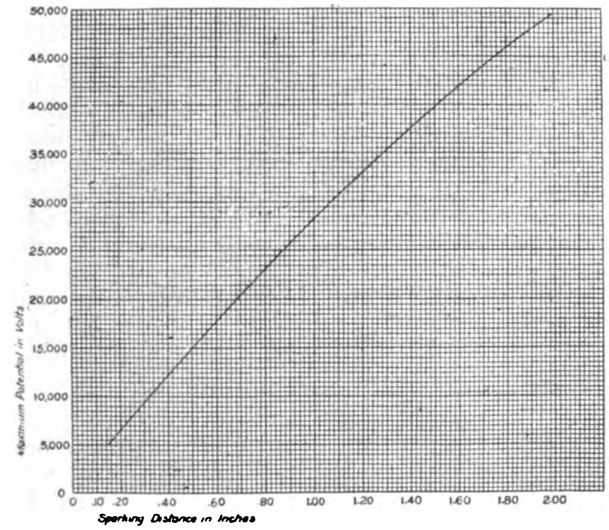

FIG. 10—VOLTAGE CURVE FOR NEEDLE GAP.

A condenser is said to have capacity, which may be defined as its property of storing the energy of electric charges in the form of an electrostatic field.

A coil is said to have inductance, which may be defined as its property of storing the energy of electric currents in the form of a magnetic field.

Capacity and inductance, as well as the other electrical quantities can be measured in three different systems of units, the electrostatic, electromagnetic, and practical.

The relation between the systems may be briefly explained as follows:

The units of the electrostatic system may be considered as based on the value of a unit quantity of electricity such that if two bodies are charged with it they will repel each other with a unit force when placed at a unit distance apart. If this charge flows along a wire it becomes a current, and if the unit charges are renewed at the rate of one every second the current so obtained is called a unit current in the electrostatic system. The units of the electromagnetic system may be considered as based on the value of a unit current of electricity such that its magnetic field will exert the same unit force as just mentioned on a body with a unit magnetic field when placed at a unit distance from a unit length of wire carrying this current. The current so defined is called the unit current in the electromagnetic system.

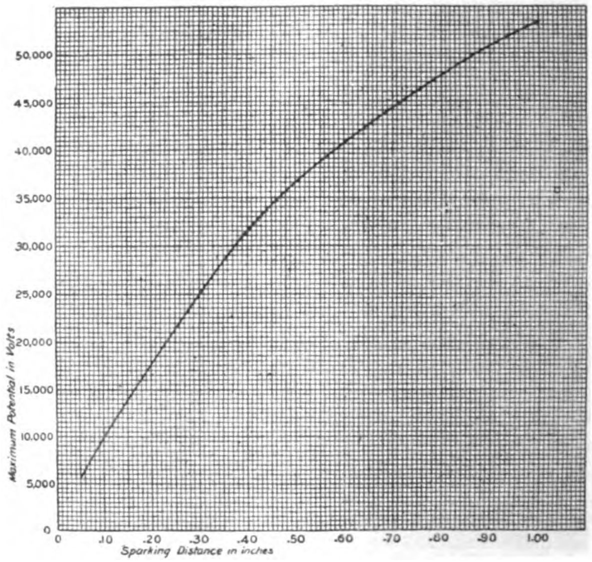

FIG. 11—VOLTAGE CURVE FOR BALL GAP.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

How is the potential of a spark discharge measured?

Of the two methods so used, which one is the more useful for low voltages?

What voltage breaks over a gap of one-half an inch between needle points?

Can electromagnetic waves be detected without having inductances and capacities in the circuits?

Define capacity and inductance.

How are capacities and inductances measured?

How many systems of measurement are there and what are their names?

What is the relation between them?

Can an electrical quantity (inductance, capacity, resistance, etc.) be expressed in any one of the systems?

Breaking in Wireless.

In wire telegraphy if the receiving operator desires to interrupt the sending operator and request' say, the repetition of a word, he need only open the line circuit by means of a switch mounted on the base of his sending key. Unfortunately this cannot be done so readily with wireless telegraph apparatus and various means have been devised in an effort to solve the problem.

It is preferable at all times to employ the "break-in" method in which the transmitting and receiving apparatus is alternately connected to and disconnected from the aerial, but when the transmitting key is raised the apparatus is connected into a receiving position. This is by all means the most dependable method.

Shop Talk.

BY THE OBSERVER.

(Continued from page 115, March 1.)

We have been harping on the adjustment of relays and sounders—quite a good subject, I heard someone remark.

I remember one day. There was fog and misty rain. I dropped in a train dispatcher's office and I noticed he had two sets of instruments alongside of each other on the same wire.

I said "S'matter, Walt, are you quadding."

He laughed and said "Beats a quad, because I have a popular and a very unpopular side." Now the idea was as follows: One relay was adjusted so that he could work with the offices about half way on a rather good reading adjustment. That was the popular side. The other relay for the distant offices was pulled up so high he could barely read his own sending on that relay (the unpopular side) but he could read himself from the relay on the popular side and get the distant office breaks, etc., on the unpopular side.

He seemed so well pleased with it, and I noticed results, therefore I mention it, as there is no penalty attached if anyone wishes to try it. Withal there are not many circuits nowadays that would have such faulty insulation.

Some of the boys along the road may wonder why the wire chiefs on Sundays ask them to open each wire a minute. That is done to make insulation tests; to ferret out the bad spots; to have the linemen clear them up before such conditions as our friend the train dispatcher had confronting him are experienced. Therefore do not become sullen or show a disinclination to co-operate with the wire chief.

It is a well-known fact that during rainy weather abnormal adjustments must be made along the line, and as "charity begins at home," that little wonder, the sending machine, must in many cases be adjusted much differently than in dry weather, especially as regards the dots and the speed.

It requires a certain length of time for the coils of magnets (relays in this case) to fill and unfill, that is to say, to properly magnetize and demagnetize the relay core, even in dry weather, while in wet weather the various leaks due to wet poles, cross-arms, dripping insulators, etc., cause a lag of current; the magnets do not let go with their usual promptness. Therefore to attempt to drive the sending machines at top speed may often delay rather than move the business. Only a test will prove what is the best that can be done. This, of course, refers to single line circuits and a common side of a quad. The polar side, or a polar duplex, will usually carry at top speed regardless of the weather.

(To be continued)

To Measure Current.

For satisfactory operation of telegraph circuits the strength of current must be kept within certain definite limits. In the case of a simple Morse circuit equipped with 150-ohm relays, these limits are forty and sixty milliamperes; with 35-ohm relays on such a circuit the limits are fifty and seventy milliamperes. For a quadruplex circuit, with the grounding switch thrown at the testing station, the "long end" of the distant battery should give between sixty and seventy-five milliamperes and the "short end" between twenty and twenty-five milliamperes, the mil-ammeter being cut in between the set and the line wire at the testing station. For a polar duplex, a similar measurement should show twenty-five to forty milliamperes.

Accurate measurements of the conductivity resistance of a wire are best made by means of a Wheatstone bridge, for the use of the bridge testing set. Where only a fair degree of accuracy is required, however, such measurements may be made with greater speed by the voltmeter-ammeter method.

QUESTIONS ON MEASUREMENT OF CURRENT.

What are the limits of current allowable on simple Morse circuits with 150-ohm relays, and with 35-ohm relays?

What are the limits of current for the "long end" of a quadruplex circuit and for the "short end?"

How should the mil-ammeter be connected to make this test at the testing station?

What are the current limits for a polar duplex?

What is the best way to obtain accurate measurements of conductivity resistance?

What other method is there for testing for conductivity resistance?

Mobilizing Messengers.—Arrangements to mobilize the messenger boys of the different telegraph companies in New York for service in the event of war and to give them training to insure their usefulness to the government, have been made by the National School Camp Association.

Hon. T. C. Ashcroft, mayor of Memphis, Tenn., a former telegrapher writes:—"I thank you for the opportunity of renewing my subscription to Telegraph and Telephone Age." Mr. Ashcroft was for many years with the Associated Press in New York before going to Memphis, where he has occupied many positions of importance and trust during the past twenty years that he has been a resident of that city.

MR. JEFF W. HAYES' DEPARTMENT.

The Pleiades Club.

CHAPTER X.

"Are you gwine to be a member of the Pleiades Club?"

"Yes, I is; indeed, I is."

This refrain was sung with much gusto by the members of the telegraph club in session at the Telegraphers' Tabernacle, on the planet Mars on the afternoon of the day set apart for the telegraphers' tournament. The song was set to the music of the "Old Lime Kiln Club" and was enthusiastically received.

From all points of the compass were arriving in balloons, dirigibles, aeroplanes, members of the craft anxious to be present at the big blow-out. Submarines, however, only on pleasure bent, came up the Hesperian canal, filled with the operators of the olden days; across the River "Styx" arrived colony after colony of ex-telegraph officials, operators and linemen, but there was no elbowing to obtain a front seat.

President Fred. Catlin looked magnificent as he called the vast assemblage to order. This took some little time, as there were many new arrivals and much interest manifested by those already in the Tabernacle to see who the newcomers were; there was also much visiting and good humor, hilarity, and everybody was happy.

"As a preliminary," said Mr. Catlin, "I will take pleasure in giving our friends an illustration of how the Western Associated Press was worked in 1875. We will have Albert S. Ayres, whom you all knew as 'Patsey' Ayres, do the sending at Cincinnati and the following gentlemen will do the receiving: at Indianapolis, Milton Goewey; St. Louis, John W. McDonald of Texas; Louisville, Charles Newton; Memphis, Ed. Foote; Nashville, James U. Rust; Chattanooga, Jack St. Clair; New Orleans, Taylor Adams, and at Galveston, Alex. Sinnott.".

At the mention of each of these names, a shout of approval shook the audience, which indicated that all were well and favorably known.

"Patsey" Ayres had been fumbling with the key for several minutes, screwing it up until there was less than a thousandth part of an inch play, and then began a series of dots and dashes, fast and furious, but beautiful to listen to and like the music of a grand opera to the trained ears of the telegraphers present.

For an hour or more Mr. Ayres continued his tireless and musical performance on the key, but never once was it necessary for any of the receivers to break him. All of these operators were wizards with the stylus and many in the audience took back with them a manifold sheet as a souvenir of the occasion.

This was a particularly happy event and recalled to mind to so many the great receiving of forty years ago.

"I find that you are so much pleased with this event that I shall take pleasure in giving you an illustration of how 'C. U. B.' was sent over the Overland in early days from Chicago," said the president, "and I have called for the following gentlemen to officiate:

"J. De Witt Congdon will do the pitching in Chicago and the following will do the receiving at their respective offices: 'Dad' Armstrong at Omaha, John Wilkie at Cheyenne, George Merrifield at Denver, Edward C. Keeler at Ogden, Jack Wolfenden at Salt Lake, P. A. Rowe at Elko, Davey Crawford at Virginia City, Joe Wood of Boston and E. H. Beardsley at Sacramento, George Bowker and John Lowrey at San Francisco, John Donnelly at Los Angeles, Billy Leigh and G. W. Thurman at Portland, Sam McIntosh at New Westminster, B. C., and John Henderson at Victoria, B. C."

"Gentlemen," said Mr. Catlin, "this is a long circuit and you see you can have any kind of weather you desire, from extreme cold to the torrid zone, almost, but this never interferes with a good operator, and now the performance will begin."

While Mr. Congdon's sending was not as beautiful as was that of Mr. Ayres, it reached each point to the extreme northwest down to the region of the Catalina Island, each dot and dash arriving at its terminal in perfect shape.

This was certainly a great feat and it was much talked about by the happy visitors.

There was some delay in making the preparations and before the main event was reached it was suggested by Hank Bogardus that the business be suspended for the time being, so that all could witness a game of base ball about to open on the Elysian Fields, at the rear of the tournament hall. "Those baseball enthusiasts," said Bogy, "will make such a noise that it will be impossible to hear our instruments in the hall, and I for one do not want to have the beautiful Morse that will be in evidence drowned out."

All agreed to the suggestion and forthwith there was a parade from the hall to the ballgrounds of famous telegraphers that shone in the earthly telegraph firmament in years gone by.

It was interesting to hear the remarks made by these former "knights of the key" as the different plays were made, showing plainly that they had not lost any of their former enthusiasm for the national game.

"Who is the manager of the office on the grounds?" inquired Billy Blanchard. "Bring him up here so he can enjoy the game with us," but before that official could be found and Billy's request carried out the game had finished and the telegraph crowd returned to the hall to take up their work where they left off. When they got back and seated it was evident that they were hardly in the right frame of mind, after the excitement over the base ball game, to resume the details of their own work, so President Catlin said that as there was no hurry to finish the work in hand he suggested that the tournament be adjourned until the next day. This would give all hands a chance to get over the effects of their base ball experience and be able to concentrate their thoughts upon the more important work in hand.

This suggestion was gladly accepted and all filed out and boarded a canal craft for a ride down one of the Martian waterways in the beautiful moonlight. They were still talking base ball.

Comment.

We are in receipt of the following note from W. J. Lloyd, of Bayou La Batre, Ala.: "I am reading with much interest 'Pleiades' articles. You must have a wonderful memory and you have surely stirred mine, as I knew all those mentioned so far. Keep it up and God speed to you."

H. A. Tuttle, president North American Telegraph Company, Minneapolis, Minn., also expresses himself in the same vein. We sincerely hope that it will be many years ere we chronicle the arrival of these two gentlemen on the planet Mars.

J. F. Marshall, chief operator, Western Union Telegraph Company, San Antonio, Tex., who has filled that position for more than thirty years, writes as follows: "Please find enclosed $1.00 in payment for your new book, Memoirs and Autographs of the Telegraph. I am very much pleased with the book and wish to congratulate you upon the merits of the same and your energy in the composition of it. I wish you successful sales of your book."

D. A. Mahoney, of New York, writes under a recent date as follows: "I want to congratulate you upon connecting yourself in a business sense with J. B. Taltavall, of TELEGRAPH AND TELEPHONE AGE. I sincerely trust that you have made a move that will prove financially profitable to you."

Notes from Winnipeg, Man.

CANADIAN PACIFIC RAILWAY.

Back in '78 I used to copy signals in Omaha in the early morning, and it would be very cold there occasionally. But when the reports showed Fort Garry 57 and Pembina 69 degrees below zero, a cold shiver would run down my spine and I thanked Providence that my lines were cast in a warmer climate. I never dreamed that I would visit Fort Garry in the depths of winter.

Fort Garry has been taken off the map and a wonderfully thriving, pushing city named Winnipeg has sprung up in its stead. Winnipeg is justly named the "Chicago of Canada," and it is deserving of the cognomen.

The snappy, crimpy air animates the dweller here and inspires him to move quickly and to be doing something all the time. A sluggard could not exist in this bracing, health-restoring climate. You seldom find a chocolate-colored individual, for most everybody possesses a rosy complexion, indicative of health and vitality.

Winnipeg has been hit very hard by the war and she has nobly responded with finances and the blood of her sons in response to calls upon her, furnishing more than her quota of money and soldiers for the defense of the honor of her country.

The Winnipeg Canadian Pacific office has given a large number of its boys who have gone to the front unhesitatingly, and are still there in the trenches.

It was a beautiful sight to see the young ladies of this office, whenever they have a "let up" on their wires, putting in their spare time knitting socks for some loved one at the front. One of these ladies used red, white and blue yarn and confidentially informed me the socks were going to her beau, who was an American boy but who had enlisted in Canada.

The system of street cars here is far ahead of any city I have visited. The cars are warm and comfortable, the attendants uniformly polite and the safety man-catcher is the best of the kind used on this continent. It is absolutely safe, and one messenger boy tells that it is really a pleasure to be run down by a street car.

Nowhere in the country can be found a more superior class of operators than are employed by the Canadian Pacific in Winnipeg. They are all proud of their calling, loyal to their company and to their country and to their friends, and when I say this it takes them all in.

Although the temperature was 40 and 50 below zero, the hearts of the Winnipeg boys and girls were warm and all physical discomforts were forgotten when we visited this office.

I remained over twenty-four hours to greet Mr. J. McMillan, manager of telegraphs, with headquarters at Montreal, who was en route to Winnipeg on official business, accompanied by Mr. W. Marshall, assistant manager, who went up the line to meet Mr. McMillan.

It was a delight to spend fifteen minutes with Mr. McMillan. He is easy to approach and is very affable, courteous and solicitous, He has the interests of his employes at heart and in dealing with his company he never loses sight of the men under him and he is much loved and respected by all of them.

Mr. W. Marshall, assistant manager, is a gentleman of the same type and calibre and is a "big" man every way.

Mr. John Fletcher, superintendent of traffic, is an old-time telegraph man who has worked up to his present position from merit alone, and has distinguished himself by his faithfulness to the company as well as for the inspiration with which he fills the breasts of his staff. Mr. Fletcher believes in giving due credit to all of his men for everything they do to promote the company's interests.

Mr. E. M. Payne is superintendent of the Manitoba district and is the right man in the right place.

Mr. P. G. Bowman, chief operator, is a Canadian boy full of good instincts, energy and is a student of his profession. In this he is ably seconded by W. H. Conklin, wire chief and E. L. Weaver, night chief.

It is a pleasure to append the following names of the Canadian Pacific Telegraph force:

W. Marshall, assistant manager; J. Fletcher, superintendent of traffic; A. G. Hanson, chief clerk; Misses Edith and Lillian Kingston, stenographers; E. M. Payne, superintendent; G. A. W. Jackson, chief clerk; Miss Clara Fulton, stenographer; Harry Cera, filing clerk; B. R. Calder, traffic chief; Miss A. Rodger, timekeeper.

R. R. Russell, city manager; P. G. Bowman, chief operator; W. H. Conklin, day wire chief; E. L. Weaver, night chief operator; R. M. Russell, all-night chief operator; R. J. Pennie, day traffic chief;

J. V. Duncan, Eastern Division, day traffic chief; R. E. Jones, West and South, day traffic chief; W. J. Kane, night traffic chief; S. J. Greenway, assistant night traffic chief.

Operators: Miss Madge Brown, F. Bergson, T. W. Cross, R. J. Elworthy, R. Ellam, Miss H. Fink, W. N. Glenn, J. W. Gaines, E. E. Jessop, F. N. Kiefer, Miss L. Keats, Miss Keating, Miss H. MacKay, Miss Ida Macdonald, Miss E. McLearn, Miss Ruth MacLennan, Miss E. Macdonald, Hugh Macdonald, R. J. McIvor, L. W. McCandlish, Carl Sherman, Miss M. Steene, R. C. Start, J. A. Turnbull, J. A. Tingley, R. C. Trespe, Miss Watterson, M. Ramsay, A. Hudson, C. L. Siler, J. M. Duffy, M. Monson, G. H. Brown, Thos. B. Murray, R. J. Kirkpatrick, A. R. Macdonald, J. MacLeod, E. B. Norman, H. Peterson, F. P. Wheaton, Harry Keating, James Ouillette, P. F. Connolly, A. W. Wylie, C. C. Hazen, J. Kelly, J. D. Homer, George Voyer, A. Clay, S. L. MacLean, W. E. Stone, J. A. Dionne, J. A. Block, Fred Fix, P. W. McLean, L. M. Anstrom, R. L. Gillerlain, J. H. Bremner, A. H. Dow, Carl Fink, W. J. Saunders, Miss A. Rodger, timekeeper.

Winnipeg Grain Exchange: W. S. Atchison, manager; Operators, H. Evoy, C. N. Frye, C. Hankins, W. Ryan, W. Snyder, P. O'Connell, J. Mullaly, C. A. Ermatinger, G. R. Erisman, J. W. Berrisford, E. M. Hearn, J. W. Scriver.

CANADIAN PACIFIC RAILWAY COMPANY DEPOT OFFICES.

It was very pleasant to meet and spend an hour with J. A. Burns, chief operator of the Canadian Pacific Railway Telegraph office at the depot, who introduced us to the members of his staff.

J. F. Lyons, J. A. Little, J. W. McCaughrin and C. D. O'Connell are members of the force and are fine telegraph men and come from good old Canadian stock.

Following is a list of the operators and other employes:

J. A. Burns, chief operator; W. H. Perdue, night chief operator. Operators: R. Anderson, J. F. Lyons, J. W. McCaughrin, J. W. Clark, A. E. Lucier, A. E. McCrea, J. W. Martin, C. D. O'Connell, S. W. Albertson, J. A. Little. Dispatchers' office: C. L. Callaway, chief dispatcher. Operators: J. G. Ferguson, G. M. Sherleck, M. E. Farwell, S. B. Ingo, S. A. Todd, J. Walker, A. S. McKechnie.

GREAT NORTH WESTERN.

The Great North Western Telegraph Company made its bow to the people of Manitoba about the time that Fort Garry changed its name to Winnipeg.

It was "poor picking" for the new company at first, but now it has doffed its swaddling clothes and emerged as a first-class telegraph company. Some of the employes of this office belong over in "Yankeedoodledum," but the greater number are of Canadian birth and are some of the finest chaps in all the world.

It was a real treat to meet J. G. Davies, superintendent of this company, who has just recovered from a serious illness. Mr. Davies has risen to his present position on merit alone and he is a ready judge of similar qualifications in others.

L. Cadle is a most popular and wholesome young man, who has recently been appointed manager of this office. He is keen to the company's interest.

A. W. Newcombe, solicitor for this company, is a wide-awake young man, who allows no prospective business to escape.

A. D. Campbell, formerly of Spokane, is day chief operator.

We are indebted to Robert Hamilton, traffic chief, and J. J. Irwin, night chief operator, for the interest manifested during our stay in Winnipeg.

It was a pleasure to again meet Wm. H. Peache, night wire chief, who "Welcomed our coming and sped our parting."

The friends of C. E. MaLette will be glad to learn that he is permanently located in Winnipeg and is doing excellent work at the Grain Exchange.

The following is the roster of this office:

J. G. Davies, superintendent; L. Cadle, manager; R. N. McDougall, cashier; A. W. Newcombe, solicitor; L. Putallo, delivery clerk; A. D. Campbell, chief operator; A. E. Holmes, assistant chief operator in charge of plant; J. J. Irwin, night chief operator; W. H. Peache, night wire chief; C. A. Johnson, all-night chief operator; R. Hamilton, traffic chief. Operators: P. N. Olson, J. A. Perry, W. M. Moyle, A. Demers, E. P. Newton, R. Gislason, J. Lavery, C. J. Hassett, E. Martin, J. Ard, H. Saults, N. A. Gilberstadt, A. A. Bright, C. D. Crosswaite, J. L. Griffin, G. McIntosh, G. Black, R. S. Bouche, J. M. Mew, Mrs. R. Best, Miss M. W. Stewart, J. Short, J. R. Fredericks, Mrs. Maude McIntosh, M. Chadwick, Miss Bertha Hall, A. D. Legg, Agnes Thomallo, J. Jacksie, Buck Goldovsky, A. M. Stewart, Mrs. Luna Carter. Grain Exchange: F. W. Lee, manager; W. Russell, assistant manager; A. H. Forde, C. E. MaLette, G. Nicholson, Commercial News Department. A. Robinson, operator.

GRAND TRUNK PACIFIC TELEGRAPH COMPANY.

The Grand Trunk Pacific Telegraph Company, maintains two telegraph offices, one at the depot and the up-town office on Portage street.

F. T. Caldwell is division superintendent and a delightful person to meet.

R. M. Hicks, a most genial gentleman, is manager of the up-town office and S. Hutchinson is chief operator of the depot office.

We met the following operators and clerks of this company:

F. T. Caldwell, division superintendent; R. M. Hicks, city manager; H. A. Ball, Miss M. Burke, F. Miller, and J. Stevens, operators; Miss M. Phillips, Mrs. J. MacIntosh, Miss E. Beaumont, and G. Steves, clerks. Railway service office: S. Hutchinson, chief operator; J. A. C. Kelman, C. C. Church, E. C. Lytle, and J. J. Graham, operators; C. W. Lockhart and E. D. Atkinson, clerks.

CANADIAN NORTHERN RAILWAY SYSTEM.

This office is located in the Union Station and is in charge of Wm. E. Love, manager, a most popular and competent telegraph man. He is assisted at night by J. M. MacLean.

T. Walker Hayes, of the day force is a gilt edge operator and the same can be said of the rest of the force, whose names follow:

Wm. E. Love, chief operator; J. M. MacLean, night chief operator; T. W. Hayes, H. Olsen, O. H. Quealy, T. J. Murphy, Thos. Sadowski, A. L. Young, A. B. Garrett, C. L. Russell, J. L. Bruyere, and J. B. Blackwell, operators.

Winnipeg's Tribute to the War.

BY W. H. CONKLIN.

Of the active employes of the Canadian Pacific Railway Company's Telegraph, at Winnipeg, thirty operators, twenty-five clerks and bookkeepers, thirty-five messengers and two caretakers have enlisted and are now fighting for Canada and the Allies in France and Belgium. Thirty former employes, operators and clerks are also overseas with Canada's army.

Among the operators, many of them well known, not only in this country but throughout the United States, are found the names of John E. Holmes, Wm. Ross, Frank S. Fenton, Gordon McTaggart, James Gray, Donald J. Rollo, Eddie A. McCrady, Stanley Bradford, Thos. Sheridan, Wm. J. Duff, Thos. Shackleton, C. S. Williams, Reg. F. Beckett, Jas. Shepherd, Clarence Kew, Lieutenant W. C. Biehl, H. K. Jack, Geo. A. Depp, J. F. Connaughton, L. A. Mintie, Gordon A. Ham, Dave W. Dooley, Thos. M. Young, L. Reese, L. Chambers, W. W. Taylor, Alex. McRae, G. E. P. (Eddie) Walker and others. Several of them were born in the United States, but becoming imbued with the spirit prevailing on this side of the line, offered their services.

Eddie McCrady, (well known in Chicago) won the second highest military honors, the military medal for conspicuous bravery in repairing telegraph wires under heavy fire at the Somme.

The operators named are with one or two exceptions in the field telegraph and telephone service in France and are considered a most valuable unit of General Haig's army.

The lady operators of Winnipeg are kept busy knitting and sewing for "our boys." Parcels containing "eats," tobacco, cigarettes, toilet articles, chocolate and other luxuries are sent monthly.

The Canadian Pacific Railway Company pays its employes their full salary for the first six months of enlistment and has spent in this way many thousands of dollars.

Other Canadian telegraph centres have done nobly, but Winnipeg claims the banner for the highest percentage of employes enlisted.

Miscellaneous.

VICE-PRESIDENT MILITARY TELEGRAPH CORPS.—Mr. Arthur Lincoln Tinker has been appointed vice-president of the United States Military Telegraph Corps in place of his father, Charles Almerin Tinker, deceased.

F. W. ROEBLING, aged seventy-five years, treasurer and general manager of John A. Roebling's Sons Company, Trenton, N. J., the well-known wire manufacturing concern, died at his home in Trenton, March 16.

THE TELEGRAPH AND TELEPHONE LIFE INSURANCE ASSOCIATION has levied assessment 618 to meet the claims arising from the deaths of E. Von Eye at Dutch Town, La.; S. A. Howard, Greensboro, N. C.; H. L. Gregg, Rochester, N. Y.; G. W. Dyer, Buckland, Ohio; J. M. Driver, Narrowsburg, N. Y.; R. H. Hunt, Nashville, Tenn.

LETTERS FROM OUR AGENTS.

New York Western Union.

S. B. Haig, division traffic superintendent, was in Washington on company business last week.

Among recent main office visitors were Harry McKeldin, chief operator of the Washington, D. C., office, and C. E. Willoughby, assistant chief operator, multiplex department, Chicago. Mr. Willoughby is essentially a telegraph man. His father, Charles Willoughby, occupied many official positions in the San Francisco as well as the Chicago offices, and was at one time in charge of the Wheatstone department. He died at Chicago about thirteen years ago. Mr. C. E. Willoughby began his telegraph career in the Wheatstone department at San Francisco and has been a close student of automatic systems. He was greeted while in New York by many of his father's old friends.

Michael Hoey, for many years a porter in the general operating department and now a pensioner, has returned to the office to help out. Mr. Hoey is one of the old reliables in the service.

There are at present 109 students attending the multiplex school.

T. B. Clark is acting as assistant chief operator in the distributing center vice Paul Eley who has been transferred on traffic work at New York City non-functional offices under Chief Operator Palmer's supervision.

The membership of the combined educational societies of the Eastern Division has now passed the 1,500 mark.

The New York Educational Society will hold an informal dance in the company's rest room on April 12. The committee on education has arranged an interesting series of lectures on subjects of telegraphic interest to be given on alternate Wednesday evenings. The lecturers are all experienced in the subjects to be talked upon and the course should prove helpful to all.

Engagements announced: Miss Minnie Metzler of the statistical department and Wm. I. Ingham of the division traffic superintendent's office and Miss May Kinney of the statistical department and O. H. Browne of the Commercial News Department. These four young people are very popular in the general operating department.

George W. Jessup, formerly receiving clerk, Western Union Telegraph Company, Los Angeles, Cal., and now in the chemical and rubber specialty business in Boston, Mass., was a recent Central Cable office visitor.

Philadelphia Western Union.

P. E. Brown of the plant department at Philadelphia, who has been laid up from the effects of a stroke of apoplexy since the middle of last December, is now almost entirely recovered. After spending two weeks at Atlantic City, N. J., he will return to his office.

The Electrical Aid Society of Philadelphia has issued in small pamphlet form the report of the proceedings of the twenty-ninth annual session of the society, which was held January 10. It comprises a full statement of the affairs of the association. Charles A. Huver is president, W. E. Van Arsdall is recording secretary and R. C. Murray financial secretary.

Philadelphia Postal.

Chas. S. Almes assistant wire chief of this office held a demonstration with Morse telegraph talking machine records. To the amazement of his audience he held them spell-bound to the clean cut Morse that these records produced at any speed desired. It was a novel and interesting entertainment.

Edward J. Lewis has been advanced to first New York printer nights.

Under the guidance of Foreman J. R. Gorsuch, the station linemen in this district are busily engaged in getting all lines in trim to withstand leakage from spring rains. Our circuits are particularly free from leakage troubles, due to the great pains taken to keep trees and shrubbery trimmed. Another notable advance in telegraph practice is the greatly lessened troubles from lightning storms, due to the adoption of more efficient protective measures.

John Ward, fifty years of age, an employe connected with the delivery department, was accidentally killed on his way home a few days ago.

Business at Philadelphia continues to hum and a number of additions have been made to the operating force.

C. R. Hulse has resigned to enter the service of a local bond house.

A. Clyde Carmine, formerly manager at the *Evening Telegraph,* has been appointed manager of the Drexel Building branch.

M. M. Flood has been appointed assistant to Foreman Fitzgerald, of the Burglar Alarm Department. He is succeeded as manager of the 253 South Twentieth Street branch office by J. R. Dickerson. Mr. Dickerson signalized his debut in the burglar alarm field by recently capturing a negro breaking into a house.

A. E. Calder, manager at Belair, Md., a member of the State National Guard, has been called to the colors.

O. C. Balmer of this office, has been temporarily transferred to Belair.

A new branch office at Salisbury, Md., has been opened with R. D. Smith in charge.

Indianapolis Western Union.

The following managers have been appointed in the sixth district, Western Division:

Forrest Jolley, at Linton, Ind., vice O. G. Bradford, transferred to Greenwood, vice D. C. Biddinger, appointed manager of the new office at Edinburgh, Ind.; N. M. Cover, at North Vernon, Ind.; C. E. Wiley, Urbana, Ill.; Miss Ruth Doyle, Lebanon, Ind.; W. B. McKinley, Boonville, Ind., vice C. H. Sly, transferred to Washington; E. G. Kyte, Joliet, Ill.; C. H. Spilman, Salem, Ind., vice W. H. Ragsdale, transferred to a similar position at North Manchester.

Manager E. W. Smith, at Alexandria, is absent on account of sickness and Miss Ruth Moore is in charge temporarily.

Mr. B. J. Graybill, formerly manager of the South Bend, Ind., office, is now manager of the company's interests at Joplin, Mo.

Jacksonville, Fla., Western Union.

This office contains two multiplex installations, one two-channel with Miami, Fla., and one three-channel with Atlanta, Ga. Both are a great success. The following compose our local official staff: C. E. Harrison, chief operator; W. R. Shearer, assistant chief operator; J. W. Ayers, night chief operator; F. M. Houser, late night chief operator; S. W. Perkins, wire chief; C. E. Landers, night wire chief. Test board attendants, J. D. McLarty and G. C. Harris; repeater attendants, D. R. Berrie and W. E. Bradley; automatic attendants, R. L. Revely and L. E. Mansfield; supervisors, R. C. Patterson, P. H. Brenner, A. H. Russel, E. P. Mashburn, and H. D. Hernandez.

Telegraph and Radio Operators, Electricians and Linemen, wanted for Signal Corps, U. S. Army. Pay ranges, according to rank and service, home or foreign, from $15 to $90 a month, and in addition rations, quarters, clothing and medical attendance are furnished. Signal Corps offers unusual opportunities for foreign service and rapid promotion to young men of character, intelligence and ability, who have had electrical training, particularly as telegraph or radio operators. For detailed information write to Chief Signal Officer, U. S. Army, Washington, D. C.

32d YEAR

Serial Building Loan and Savings Institution

President, - - - - T. W. Carroll
Vice-President, Thomas M. Brennan
Secretary, - - - Edwin F. Howell

Resources - - - $1,000,000
Surplus - - - - 40,000

Business conducted under the Banking Law of New York

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Western Union Building, 16 Dey Street, 9 a. m. to 5 p. m.
Postal Building, 253 Broadway, Room 1030, 2.30 to 4.30 p.m., Fridays, and each 15th and last day of month.
Telephone Building, 24 Walker Street, Room 1129, Daily 9 a. m. to 2 p. m.
Saturdays 1 p. m.

Rubber Telegraph Key Knobs.

No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. Address orders to TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York.

Telegraph and Telephone Age

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BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, APRIL 16, 1917.

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The War and the Telegraph and Telephone.

The declaration of the existence of war between the United States and the German Imperial government is not likely to create much of a change in the relations between the government and the telegraph and telephone interests. The wireless stations have been taken possession of by the Navy officials, but the telegraph and telephone companies are still conducting business as in normal times.

Stories are going the rounds to the effect that these companies are under government orders, but they are characterized as gross exaggerations. The companies are required to give government business precedence and that is the only "order" they are carrying out at the present time. The telegraph and telephone companies, however, are ready to meet all demands put upon them by the changed conditions, and there may be occasional pressures of business at the principal points if much activity should develop in the movements of the army and navy, but the facilities of the companies are such that all classes of business will be dispatched with the usual promptitude, government messages at all times having the preference and right of way.

Silencing Amateur Wireless Stations.

The police authorities are actively at work all over the country dismantling amateur wireless stations. In New York City alone there are about 3,000 such stations, about half of them unlicensed, The police seized 800 outfits in one day. There are over 4,000 amateur stations in the state, and there will be wailing and gnashing of teeth among the boys at the loss of their hobbies.

Have You a Definite Purpose in Life?

Most men, and women too, have some purpose in life, but often the object is lost sight of and they drift from one thing to another without accomplishing anything definite. It is a great victory over the frailty of humanity to keep our purpose constantly in view, and work for it all the time.

This should be the ideal of every telegraph man. He should see a position ahead of him that he would like to occupy and then work to secure the prize. That little word "work," however, is the sticking point to a good many, who are lacking in back-bone. Many young men are wasting much of their time waiting for opportunity to get behind them and push them toward their desired goal. But this never happens. Opportunities are open on all sides but we must work to take advantage of them.

Winners are workers with an aim, that's all. There is no luck about it. The secret of winning is the unyielding fight toward a definite ideal, and a man with a definite aim and the courage to follow in its path cannot fail. This is a law that cannot be circumvented. It has been said that what we aim to be, we already are —potentially.

There never has been a time when the opportunities presented to the telegraph man for advancement have been as plentiful and promising as at present, and as time passes the more numerous are the opportunities, but we must work to seize them. Every man in a position of prominence has, without exception, worked hard to get where he is, and he always had his purpose before him as a guide.

Some time ago Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company, said his greatest difficulty is in finding men capable of earning five thousand dollars a year or more, not men who think they are worth five thousand dollars a year. There are plenty of the latter, but they fail when put to the test of earning ability. There is a vast difference between thinking you can fill a big position and actually filling it with ability. Such positions can be filled by those who will make up their minds to capture such prizes and work for them.

Telegraph and Telephone Patents.

ISSUED MARCH 18.

1,219,459. Telephone Mouthpiece. To S. M. Hino, Lander, Wyo.

1,219,522. Telegraph System. To John E. Wright, New York.

1,219,531. Telephone Line Disconnection. To M. S. Bricka, Milan, Ind.

1,219,561 and 1,219,955. Quadruplex Telegraph. To I. Kitsee, Philadelphia, Pa.

1,219,587. Telephone Exchange System. To J. N. Reynolds, Greenwich, Conn.

1,219,620. Telephone Instrument. To F. E. Bentley, Maplewood, Mo.

1,219,656. Telephone System. To T. G. Martin, Chicago, Ill.

1,219,700. Telephone Exchange System and Apparatus Therefor. To M. Bullard, New York.

1,219,727. Telephone Repeating System. To E. Grissinger, Buffalo, N. Y.

1,219,888. Combined Receiver and Detector for Wireless Use. To F. Wallberg, New York.

1,220,005. Wireless Signaling System. To J. H. Rogers and H. H. Lyon, Hyattsville, Md.

1,220,072. Method of Wireless Signaling. To L. Cohen, Washington, D. C.

ISSUED MARCH 25.

1,220,228. Telephony. To D. S. Hulfish, Toronto, Ont., Can.

1,220,238 and 1,220,756. Quadruplex Telegraphy. To I. Kitsee, Philadelphia, Pa.

1,220,920. Wireless Sounder. To A. J. Williams, Covington, Ky.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on April 10:

American Tel. and Tel. Co.	124
Mackay Companies	85-86
Mackay Companies, pfd.	64½-66
Marconi Wireless Tel. Co. of Am. (Par value 5.00)	2¾
Western Union	96

PERSONALS.

Mr. Henry F. Albright, general superintendent of the Western Electric Company, has been elected a vice-president of the company. He will continue as general superintendent of the manufacturing department.

Mr. Walter P. Phillips, who is spending the winter at Fort Myers, Fla., gave a demonstration recently of wireless and regular Morse records upon a Columbia graphophone for the benefit of local telegraphers and telephone men.

Mr. G. A. Nelson, former secretary and treasurer of the Gordon Primary Battery Company, New York, has been appointed special representative of the Waterbury Battery Company, Waterbury, Conn. His headquarters will be in New York. Mr. Nelson was secretary-treasurer of the Railway Telegraph and Telephone Appliance Association from 1914 to 1916.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. Edward Reynolds, vice-president and general manager of this company, is now on his way home from the Pacific Coast, where he has been on a business trip. He will stop at various places on the way.

Mr. W. I. Capen, vice-president, New York, has returned from a trip of inspection through the southern states, going as far as Baton Rouge, La.

Mrs. Adelaide Hilton, daughter of Mr. C. M. Baker, general superintendent of plant, Chicago, died March 3.

New Poughkeepsie Office.—This company is now moving into its new office at Poughkeepsie, N. Y. The new quarters are stated to be up to date in all respects and are comfortable and attractive. Mr. H. K. Perkins is the manager.

Magnetic Club Dinner April 19.—The spring dinner of the Magnetic Club, which will be held at the Hotel McAlpin, New York, April 19, will be one of unusual interest, and there is every indication that there will be a large attendance. Several prominent gentlemen have been invited to attend. President C. C. Adams is giving earnest attention to the meeting and is doing all he can to make it a success.

Interference by High-Power Lines.

The Iowa Public Service Commission on December 30, 1916, laid down general rules as to proper construction when high-tension and low-tension wires are on the same highway. Following are the most important of these rules:

"A telephone or telegraph company, because of prior occupancy, does not have a right in the highway superior to that of a company facilitating ordinary travel.

"But a telephone or telegraph company having prior occupancy does have a right in the highway superior to that of another telephone or electric company exercising equal or similar franchise. This superiority does not go to the extent of giving an exclusive right to the first company. But this superiority does carry with it the right to be protected from unreasonable interference by the latter company.

"A telephone or telegraph company having been the first to build its line in a given public highway or along a certain private right of way, is entitled to continue the usual ordinary operation of its plant in that location without any interference of a substantial character from any transmission line constructed at a later date in close proximity to its said line.

"Ordinarily a high-transmission line causes substantial interference with the operation of a telephone line paralleling for a considerable distance, and in close proximity to, the transmission line, unless the transmission line is properly constructed, well balanced as to both voltages and current, the telephone line is on a metallic circuit, the two lines are separated by at least the width of the highway, and they are properly transposed with relation to each other.

"There may be exceptions, but what we have stated is the rule; it is the usual, natural, probable condition. And the interference is not consequential but it is definite, positive and material.

"This commission has no power to order a telephone company to install a metallic circuit or the McCluer device, to move its line to the other side of the highway, to fix up its line, or to transpose its wires; it has no power to award or collect damages, and it has no power to enforce contracts. But the commission can prescribe the terms and conditions upon which transmission franchises shall be granted, and it has power to direct the manner of construction, maintenance and operation of transmission lines. It will endeavor to protect telephone and telegraph companies from all unreasonable interference, provided they do their part. And it will grant franchises to transmission line companies on condition that they comply with these requirements for the protection of other electric companies from unjust and unreasonable interference." — *Postal Telegraph.*

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Mr. G. W. E. Atkins, vice-president of this company, accompanied by Mrs. Atkins, made a visit to the Pacific Coast recently.

Mr. F. E. d'Humy, central office engineer, New York, has returned from a trip to San Francisco and other western points made in the interest of the service.

Mr. S. R. Crowder, traffic layout engineer, has returned to his office in New York from San Francisco where he has been on service connected with the new office to be established in that city.

Annual Stockholders' Meeting.—At the annual meeting of the stockholders of this company, held April 11, the present board of directors was re-elected with the exception of George J. Gould, who is succeeded by Benjamin F. Bush. The present executive committee and officers were also re-elected.

Among Recent Visitors at headquarters were Messrs. S. L. Burts, division traffic superintendent, Atlanta, Ga., and L. W. Robinson, division supervisor of lines, Chicago, Ill.

Mr. A. L. Wellington, for several years past chief clerk to Superintendent E. Boening at Seattle, Wash., has accepted a similar position with Mr. Boening, who is now district commercial superintendent at Detroit, Mich. Mr. Wellington is well known in telegraph circles throughout the country.

Mr. J. L. Ferciot, manager of the Omaha, Neb., office, made an address before the Rotary Club in that city, March 22, on the importance of the telegraph in business.

Inter-City Bowling Tournament.

The inter-city bowling tournament conducted by the Western Union Bowling Associations of Denver, Chicago, New York and Atlanta, Thursday evening, April 5, resulted in a victory for the Atlanta bowlers.

A direct wire was set up from Atlanta to Denver via New York and Chicago, with loops to the home alleys at each city. The New York boys bowled at the Star Alleys, Flatbush Avenue, Brooklyn. The results were as follows: Atlanta, 2,594; Chicago, 2,512; New York, 2, 457; Denver, 2,438.

The Atlanta team, by their victory, become the possessors of a handsome trophy.

The New York Western Union Bowling Association wound up its season March 29. The Accounting team again took first place and now has two legs on the president's trophy. The Plant team finished second and the Metropolitans took third place. The Departmental team, by a strong finish, tied the Metropolitans for third place but were defeated in the roll-off.

The association will wind up the season with a beefsteak dinner at Sauer's restaurant at Thirty-first Street and Broadway, New York. A theatre party is being arranged to precede the dinner.

C. J. Eldridge, Division Commercial Agent.

The appointment of Mr. C. J. Eldridge as division commercial agent of the Western Division of the Western Union Telegraph Company, with headquarters at Chicago, is a deserved recognition of the talent and the valuable services rendered to the company.

Mr. Eldridge is a Kentuckian by birth, born in Paris, Ky., November 24, 1885. He learned telegraphy at an early age, and at fifteen began his telegraph career as night operator for the Great Northern Railway out in the Cascade mountains of Washington. During the next five years he filled important wire positions with several western railroads, also the Western Union at Salt Lake and San Francisco.

C. J. ELDRIDGE.

The following two years were spent in completing his education at the University of California, Berkeley, Cal., and in December, 1907, he returned to the Western Union as manager at Santa Cruz, Cal., shortly afterwards being advanced to the more important post at Fresno, Cal.

In 1910 Mr. Eldridge was appointed district commercial manager at San Francisco, and when the accounting department was organized in 1911 he went with Division Auditor C. A. Rhodes as traveling auditor, later becoming chief clerk to that department.

When Mr. Gaunt was made general manager of the Western Division Mr. Eldridge was transferred to the position of division cable manager at Chicago.

After the advancement of former Division Commercial Agent A. R. McGrath to district commercial superintendent of the third district, January 1, this year, Mr. Eldridge, who had strongly assisted in the intensive commercial development of the past year, was the logical successor to the position left vacant.

Mr. Eldridge is resourceful, quick of discernment, able to size up and take in conditions at a glance, possessing a level head and kindly heart, with justice and square-dealing as his motto.

He has a wide personal acquaintance among managers in the Western Division, all of whom, as well as his former associates of the Pacific Division, will be pleased to learn of his promotion and will wish him success in his broader field.

Chicago Conference.

A conference of district commercial superintendents was held in the office of the general manager at Chicago, February 26 to 28, inclusive. On the suggestion of General Manager Gaunt the chair was occupied in turn by the attending superintendents, each presenting for discussion subjects upon which he wished to express his views, or secure the opinions of others. The plan afforded extended opportunity for expression of initiative suggestion and free discussion of problems, and was productive of many well-thought out constructive ideas and conclusions on practically every angle of commercial service. The meeting was voted the most successful and instructive gathering of its kind in Western Division history, and announcement by the general manager that the conference is to be a permanent feature was received with applause. Those present were: General Manager C. H. Gaunt, District Commercial Superintendents H. Brown, A. C. Cronkhite, A. R. McGrath, A. D. Bradley, E. Boening, J. C. Nelson, A. A. Montgomery and Division Cable Manager C. J. Eldridge.

In connection with the conference General Manager Gaunt tendered a luncheon to the visiting officials and their wives, at the Auditorium Hotel, on the afternoon of February 26. The occasion, which was notable as the first social gathering of members of the official Western Union family, marked a further step in the process of creating a closer community of interests among members of the Western Division organization.

The following were present: Mr. and Mrs. C. H. Gaunt, Mr. and Mrs. J. P. Edwards, Mr. and Mrs. M. B. Wyrick, Mr. and Mrs. H. F. Dodge, Mr. and Mrs. E. Boening, Mr. and Mrs. A. A. Montgomery, Mr. and Mrs. H. Brown, Mr. and Mrs. W. McD. Milne, Mr. and Mrs. C. J. Eldridge and Messrs. A. C. Cronkhite, A. R. McGrath, A. D. Bradley and J. C. Nelson.

General Manager C. H. Gaunt's Recent Trip.

Some years ago an operator of the old school had charge of a telegraph office which was doing a good business. The quarters were dingy and neglected, while the public's estimate of it was low. Following a visit of the general superintendent there was a transformation. New furnishings were installed, equipment of convenience to the public was introduced, and the office generally made to appear more business-like.

A year later, when the general superintendent again visited this office, he was mystified to find the newly papered walls covered with pictures clipped from newspapers and magazines; the furnishings had been neglected, and there were evidences of a desire upon the part of the manager to surround himself with reminders of the time when a public utility appropriated no money for office appearance and convenience, and this feature was left entirely to the taste and generosity of the manager in charge.

When the general superintendent called for an explanation the manager pensively replied: "The office was so shiny and new it didn't seem natural and I just tried to make it look cheerful and homelike again."

These were conditions as many of us knew them in the old days.

Today General Manager C. H. Gaunt of the Western Division, Chicago, who has just completed a two week's swing around the circle with Vice-President J. C. Willever as his guest, has searched his large territory in vain for the old office or the employe who enjoyed its peculiarities. Like the vanished bison, they are relics of a bygone day, and their places are filled by well-appointed quarters, manned with alert and progressive employes. The attitude of these employes toward visiting officers now marks another contrast between the new and the old.

Inspections and the critical eye of supervisors have lost their old terrors, and instead of dreading possible harsh and destructive criticism, managers of the Western Division looked forward with pleasure to the opportunity of displaying their well managed offices and creditable achievements to an appreciative audience, and of receiving broad counsel and helpful advice concerning their difficult local problems.

The official party, which, in addition to the general manager and the vice-president, included the district commercial superintendents in territories visited, and the newly appointed division commercial agent, Mr. C. J. Eldridge, traveled in the company's business car, "Telegraph." Shortly after leaving Chicago en route to the Northwest the threatened railroad strike clouds began to gather. They darkened as the trip progressed, and the latest bulletins were eagerly scanned at each station. Other members of the party were apprehensive while the cook insisted that "We's gwine to keep on goin' till we jest naturally stub our toe." But Mr. Gaunt, who was too old a railroad campaigner to be stampeded, declared that having induced the vice-president to travel 2,000 miles from New York to view the evidences of expanded commercial effort in the Western Division he proposed to carry out his itinerary, even if it had to be finished afoot. Fortunately, these extreme measures were unnecessary.

When the party returned to Chicago after a twelve-day journey around the great inland empire comprising the Western Division, the speedometer registered 4,500 miles, and 164 main and branch offices had been carefully gone over.

. Probably never before has such an array of uniformly model telegraph offices and energized officers and employes been passed in consecutive review. General Manager Gaunt has standardized not only the housekeeping of his offices, that they may be instantly recognized, but the commercial endeavor as well. In furtherance of this plan during the past year 256 offices were moved to better locations, or completely renovated. Of these twenty-five were moved from the second floor to the street level. Much in this line remains to be done, but already a dream has become a reality, and the telegraph office is usually the brightest and most inviting spot in its immediate community and a model for other business enterprises to follow.

Commercially, during this same year, 646 meetings of field forces have been held, 702 commercial suggestions forwarded to headquarters, 11,887 special books of messages secured and the gross division returns of the preceding year exceeded by upwards of three million dollars.

Mr. Willever expressed much satisfaction at the results and the admirable condition of the offices visited, particularly the spirit and energy everywhere displayed, which has made the Western Division organization a unit from the lowliest employe up to the friend and general adviser of them all.

THE CABLE.

London Staff Entertains Wounded Soldiers.—On March 3 the London staff of the Western Union Cable System entertained 125 wounded soldiers, representing all parts of the empire, at the Savoy Hotel in that city. Mr. T. W. Goulding, European commercial manager, made a few remarks of welcome.

Advance of Time.—Legal time has been advanced one hour in Great Britain and Ireland, France, Portugal, the islands of Azores, Madeira and Cape Verde.

Cable Censorship.

The declaration of the existence of war between the United States and the German Government has made it necessary to apply censorship to submarine cables. Cablegrams to Honolulu or any part of the Hawaiian territory and to Manila and the Philippine Islands must be written in plain language, English in the case of Hawaiian business and English and Spanish in the case of Philippine Islands business. All cablegrams must be fully addressed and signed with the proper names, and they will be accepted at the sender's risk. No code will be allowed.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to April 10, 1917, as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable), October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917.

CANADIAN NOTES.

The Grand Trunk Pacific Telegraph Company, Mr. H. Hulatt, manager of telegraphs, Montreal, Que., is distributing a desk blotter containing information about the various classes of service rendered by this company.

Mr. R. J. McInnis, chief operator of the Calgary, Alta., office of the Canadian Pacific Railway Company's Telegraphs, has exchanged positions with Mr. P. J. Bowman, the chief operator of the Winnipeg office.

Curling in Winnipeg.—The Winnipeg Canadian Pacific Railway ladies' curling rink, skipped by J. Roy Russell, played and defeated the Great North Western ladies' rink, skipped by Geo. Wainwright (in the absence of J. G. Davies, who was slightly indisposed) by the score of 11-9. This was the final game and decided the championship for the season 1916-17. Great interest was manifested throughout the series owing to the friendly rivalry existing between the companies' employes, and each rink had its supporters on hand in large numbers. The rinks were composed of the following: Canadian Pacific Railway Telegraphs—Miss J. Kliske, Miss K. McConnell, Miss Florence Spiers and J. R. Russell, skip; Great North Western Telegraphs—Miss Morrison, Miss Cannon, Miss Hanson and Geo. Wainwright, skip.

Wires Sold to Canadian Railway.—This company has entered a joint contract with the Canadian government and the Great North Western Telegraph Company to sell to the Intercolonial Railway, wires on the pole lines of the telegraph companies along that railway for use in the transaction of railway business exclusively. The Western Union and Great North Western will continue handling commercial business, as heretofore, in their respective territories reached by that railway. They will maintain the railway wires at the railway company's expense. This arrangement takes in all the Intercolonial Railway lines in the Maritime Provinces up to Sydney, N. S., and enables the railway to provide a much more comprehensive and up to date telegraph, telephone and signal system for the transaction of its railway services than it has heretofore employed.

THE TELEPHONE.

THE NEW DIRECTORY of the New York Telephone Company, issued February 1, contains 410,000 names. It has 948 pages and 712,000 copies have been distributed.

TONS OF MONEY IN COIN BOXES.—During the year 1916 four hundred and fifteen tons of silver and nickel coins were collected from the coin box telephones in Manhattan and the Bronx, New York City.

TELEPHONE MEN IN ARMY AND NAVY SERVICE.—About 500 telephone employes have been selected for the auxiliary signal corps for the Army and Navy, and some of them have already been sworn into government service.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. Chas. J. Ross, comptroller of the Marconi Wireless Telegraph Company of America, was married at Grace Church, New York, April 2, to Miss Augusta Cecelia Weber, daughter of the late Gustave Weber of Brooklyn. After a short honeymoon trip they will make their home at Bayside, L. I.

The government has availed itself of the offer of the Marconi Wireless Telegraph Company of America, placing its staff and stations at its service and has taken over for the period of the war not only the Marconi stations but all other radio stations for military purposes. The eligible operators will be enrolled in the government service. Stations not required will be closed. The trans-Pacific stations will continue handling commercial traffic, but under government supervision. No ship traffic will be permitted on the Atlantic and Gulf Coasts and the Great Lakes excepting for the government, but it will continue for the present on the Pacific. Trans-Atlantic traffic via Glace Bay will not be disturbed. The Director of Naval Communications, Lieutenant Commander Todd, at Washington, will have charge of stations operated by the government. Enrollments will be made by commandants of naval districts.

WIRELESS COMMUNICATION SUSPENDED.—Wireless communication to Hawaiian territory beyond Honolulu has been suspended. Messages to other islands will be mailed from Honolulu.

Decision in the "Heterodyne" Receiver Case.

On April 2 Judge Mayer, of the United States District Court for the Southern District of New York, handed down an opinion in the suit of Samuel M. Kintner and Halsey M. Barrett, receivers of the National Electric Signaling Company, plaintiffs, vs. the Atlantic Communication Company, August Merckens, P. C. Schnitzler and K. G. Frank, defendants, in which he found for the plaintiffs. This suit was based upon a charge of infringement of United States letters patents 1,050,728 and 1,050,441, being respectively for the method and apparatus employed in a receiving station of a radio telegraph system, These patents, issued January 14, 1913, cover the invention known to the art generally as the "heterodyne" or beats method of receiving radio telegraph signals. For the benefit of those not familiar with the trade name of "heterodyne" receiver the following explanation is given:

For receiving signals from a transmitting station in which the radiations are continuous it is necessary to utilize at the receiving station some means of rendering these signals audible. A continuous wave transmitting station radiating waves, such as sent from Nauen, Germany, for instance, having a frequency of approximately 30,000 cycles per second, is above the range of audibility and cannot be used directly to operate an indicating telephone. The "heterodyne" method of rendering these signals audible consists of producing another set of oscillations, at the receiving station, of a frequency slightly different from that of the incoming signals, and combining these local oscillations with the incoming oscillations in such a way as to compound their effects and produce "beats." These beats are then given a signal within the range of audibility and thus make intelligible the incoming signals. The local oscillations continue of uniform strength all the time, but beats, of course, are produced only during the time of existence of the incoming signals, and hence the periods of sound and silence employed in forming the dots and dashes are indicated by the pitch of the particular tone. This is generally chosen of a frequency approximating 1,000, so that in the example cited, with Nauen transmitting 33,000 cycles, the local oscillations being 32,000 or 34,000, the beat frequency would be 1,000 and give a resulting high-pitched clear musical tone.

The court found that Reginald A. Fessenden, the inventor of this system, had produced an invention of great merit and entitled to a broad interpretation. He found that the prior art cited by the defendant as anticipating the Fessenden invention had failed to teach the art anything in respect to the use of beats and, at most, merely disclosed a local source for operating some particular form of receiver. He decided against the defendants' contention that the invention should be given a narrow construction, in view of an earlier patent of Fessenden.

The defendants' sole effort was directed towards securing a narrow construction of the patents. They contended that the Fessenden patents were not entitled to a broad interpretation but should be restricted to the use of the particular form of appliance shown in the issued patents. The court decided against this, holding the invention to be of such merit as to entitle it to a broad interpretation of equivalents.

The court also stated that Fessenden or his company, the National Electric Signaling Company, were the only ones to teach the art anything of value of this method of operation between the date of application of his original patent in 1902 and the date of applications for the patents in suit, 1905.

The "heterodyne" or beats method of receiving is the one that is now commonly used by practically all stations receiving signals from transmitting stations employing sustained waves.

The plaintiffs were represented by Fred W. Winter of Pittsburgh and Drury W. Cooper of New York City, whereas the defendants were represented by Charles Neave and Harvey S. Knight of New York City. The technical experts were John L. Hogan, Jr., for the plaintiffs and Professor Jonothan Zenneck for the defendants.

OBITUARY.

George Denison, aged fifty-five years, an operator for the Western Union Telegraph Company at San Francisco, Cal., committed suicide in San Mateo County, Cal., recently.

Miss Rosa Neece, aged sixty-seven years, an old-time operator who was well-known to the telegraph fraternity in the seventies and early eighties, died at Williamsport, Pa., March 4.

Robert H. Hunt, aged sixty years, identified with the Western Union Telegraph Company in Nashville, Tenn., since 1881, died in that city January 26. He was chief operator at Nashville at one time.

John C. Wilson, aged sixty-five years, a well known inventor of electrical apparatus, died in Boston, March 8. Mr. Wilson was born in Canada and worked as a telegrapher for many railroad and various telegraph companies in the United States. For twenty years he has been located at Boston, where he has developed his various inventions, mostly in the electrical line. For the past ten years he was president and general manager of the Automatic Time Stamp Company. He was a brother of David L. Wilson, an operator of St. Paul, Minn., who died in that city three years ago.

Military Telegraph Bill.

A bill has been introduced in the House of Representatives at Washington providing that military telegraph operators who served in the Civil War for ninety days or more and who have received or are entitled to receive a certificate of honorable service shall be considered to have been mustered into the military service and honorably discharged at the date service ceased. The bill also provides that no pension shall accrue prior to the passage of the act.

New Books.

"Masters of Space" is the title of an extremely interesting book by W. K. Towers, published by Harper and Brothers, New York. It is the story of the work of the inventors and leaders in the development of the various means of communication of intelligence by electricity. These are Morse and the telegraph, Thomson and the cable, Bell and the telephone, Marconi and the wireless telegraph and Carty and the wireless telephone.

Among the contents are chapters on the different methods of communication used by the ancients, the achievement of Morse, inventions of Sir Charles Wheatstone, telegraphing beneath the sea, the birth and development of the telephone, telegraphing without wires, telephoning without wires, etc.

One of the great advantages of the book is that it brings a history of the different methods of communication into the space of one volume, and the manner in which it is written makes it one of the most interesting books on the subject ever published. It is a story that can be taken up anywhere and read with much pleasure.

The book is illustrated by portraits of the various men identified with the invention and development of these modern marvels and various phases of their work.

The new developments of the telegraph is the subject of an appendix and it brings the record of this work up to date. The multiplex system of telegraphy is well described in a popular way. Everyone engaged in telegraphy, telephony and wireless should read this book. It is a story of realities stated in an entertaining way.

The price of this work is $1.25 net, and copies may be obtained of Telegraph and Telephone Age, J. B. Taltavall, Publisher, 253 Broadway, New York.

Telephone Apparatus, an Introduction to the Development and Theory. By G. D. Shepardson, Sc. D., professor of electrical engineering, University of Minnesota, 337 pages; 115 illustrations. D. Appleton and Company, New York and London. Price $3.00.

This is the first extended treatise, in any language it is said, devoted to the general principles underlying telephone apparatus. The author by assembling all the available information and collating it with much faithfulness to detail, has done much toward raising telephony to the scientifically exact status of other branches of electrical engineering.

The book is intended to be used as a handbook of telephonic data by the inventor, designer, and manufacturer of telephone apparatus; by the installing and operating engineer; by the exchange manager and superintendent, and by those who desire to understand the intricate scientific problems of telephony.

In order to derive the greatest benefit from this book the reader should have a working knowledge of algebra, trigonometry, calculus and physics, including the laws governing direct and alternating currents, yet without a knowledge of these aids the practical telephone man will receive some help in appreciating more of the reasons for telephone practice.

The book is well indexed. It is bound in cloth and measures 9½ by 6¼ inches.

Copies may be obtained from Telegraph and Telephone Age, J. B. Taltavall, publisher, 253 Broadway, New York, at the price named—$3.00.

Bound Volumes For 1916.—Bound volumes of Telegraph and Telephone Age for 1916 are ready for delivery. The book contains 600 pages and is a complete record of progress during the year in telegraphy, telephony, cable telegraphy, radio-telegraphy and every other application of electricity for the transmission of intelligence. The contents are focused in a complete index and the valuable articles are thus readily available. There is also included an index for the year 1915 so that anyone can readily ascertain the contents of the papers for two complete years. The price per volume is $4.00 per copy, carrying charges collect. Address all orders and make remittances to Telegraph and Telephone Age, J. B. Taltavall, Publisher, 253 Broadway, New York.

INDUSTRIAL.

Foote, Pierson & Co., Inc.

Mr. Henry G. Pierson, president of Foote, Pierson & Company, Inc., recently incorporated, has spent his entire business career as a manufacturer of electrical apparatus. His father was a pioneer in the manufacture of telegraph instruments, having been in charge of the Western Union Telegraph Company's shops at Cleveland, Ohio, in the early 60's. He later came to New York to organize and take charge of L. G. Tillotson & Company's shops, and when this concern was succeeded by E. S. Greeley & Company continued his connections with the new concern for two years, when he retired on account of ill health. He was succeeded by his son, Henry G. Pierson, who remained in charge of the Greeley shops until that concern went out of business, when the firm of Foote, Pierson & Company was organized, taking over the manufacturing end of that concern. Mr. Pierson is therefore well qualified to continue this work.

Mr. Morris N. Liebmann, vice-president of the company, succeeded Mr. George L. Foote as superintendent of the factory. Mr. Foote retires from active business. Mr. Liebmann graduated from the University of Nebraska sixteen years ago, when he came to New York and entered the employ of Foote, Pierson & Company, in which he has served as electrical engineer and assistant superintendent in the factory, which experience has given him a thorough practical knowledge of manufacturing which, combined with his technical training, makes him a most efficient superintendent.

In addition to the manufacture of telegraph apparatus the concern has been extensively engaged in manufacturing wireless apparatus for commercial and government service.

It is also interested in the manufacture of fire alarm equipment, having been awarded the contract for 300 fire alarm boxes by the City of New York for the new fire alarm system being installed in that city.

The new corporation is reorganizing and rearranging its factory, replacing old type of machinery with new, up-to-date modern machines, which will enable it to manufacture instruments and apparatus of the most accurate character.

Diaphragm Telegraph Sounder.

This instrument which is made by the Railways Labor-Saving Device Company, Davenport, Iowa, is meeting with general favor. The United States Government, after a series of tests, has placed an initial order for fifty of these instruments to be used on the government circuits between Seattle and Alaska. There is no doubt as to the quality of service these instruments render. The diaphragm telegraph sounder has proven its value on all occasions and is reliable under all conditions. It solves by elimination the local battery problem and all users of the instrument express satisfactory results.

Talking Machine for Telegraph Records.

A very attractive, substantial and low priced talking machine for the reproduction of telegraph discs, or musical or other records, etc., is the "Conqueror," which we offer to telegraphers as a reliable and satisfactory instrument. In tone, quality and volume, truthfulness of reproduction and mechanical completeness, it is of surprising value. It plays Columbia and Victor records. Those who have telegraph records will find this machine very desirable and serviceable, and for the reproduction of music, singing, etc., it is equal to many much higher priced machines. The "Conqueror" is sold by TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York, for $10.00 each.

AN INEXPENSIVE AND RELIABLE ADDING MACHINE.—Telegraph managers should become interested in an adding machine which is of low cost and very useful as a labor-saving device where adding and substracting is to be done. It is infallible in its records of results, and managers will find it a great help in their work of adding, etc. It takes away a great deal of the drudgery in totalling columns of figures, and gives accurate results. The machine is known as the "Calculator," and it is being used in leading business houses in the United States and foreign countries. It is robust in construction, there is nothing to break or get out of order, and it is guaranteed for five years. It measures 12 inches long by 4 inches wide and 4 inches high, and comes in a carrying case. An illustration of the instrument is shown in the advertisement on another page. This device will pay for itself in the saving of worry in a very short time.

THE SERIAL BUILDING LOAN AND SAVINGS INSTITUTION, during the past year, increased its resources to $1,160,000. This large sum represents the savings of telegraph and telephone people, and is constantly increasing. It yields 5 per cent. to investors and there is no investment more secure. The institution is conservatively managed; it does not maintain expensive offices, and ranks high among financial institutions. It operates under the banking laws of New York, and is as carefully guarded as any other financial institution. Telegraph and telephone men should know more about this worthy association. It encourages thrift. Mr. E. F. Howell, 195 Broadway, New York, is secretary, and he will be glad to give further information.

Mr. W. H. Heeps, manager, Postal Telegraph-Cable Company, Orbisonia, Pa., in remitting to cover his subscription for another year writes: "I am impressed that your AGE acts as a self-propelled grindstone, sharpening the wits of many subscribers. If they grasp the opportunities given them they are paid many hundred per cent. for their investment in subscriptions."

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions following each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

GENERAL NOTES ON GRAVITY BATTERIES.

The advantages of the use of oil arise from the fact that preventing evaporation of the liquid and the formation of "creeping" or "white salts" a much more efficient battery is secured with a much smaller force of attendants than would otherwise be required. These white salts, or evaporated sulphate of zinc, when oil is not used rapidly creep over the edge of the cell and down to the battery stand. This dry sulphate of zinc is a good conductor of electricity and as it spreads from cell to cell is most liable to short circuit them, in whole or in part; thereby of course wasting the battery current.

By preventing evaporation the solution is kept constantly above the zinc, whereas, when oil is not used it is a common thing to find the battery "open," due to the solution having fallen below the zinc.

As intimated, a good quality of oil should be used for this purpose. It should have the following requisites: a color readily distinguishable from the solution, for instance, an auburn tint; should spread over the surface of the solution readily, otherwise waste of oil and of time in applying it will ensue; should be odorless, non-inflammable under 400 degrees Fahrenheit, and free from traces of naphtha or acid. A good lubricating oil, a product of petroleum, will meet all of these requirements.

Battery oil may, with care, be used over and over again and therefore, should be carefully preserved when the cells are being cleansed or renewed. The best method for thus preserving the oil at such times is to pour the solution of the cells, oil included, into a barrel having a faucet at the bottom. The oil will float on the surface of the solution. When the barrel is full the solution is drawn off at the faucet until the oil is reached, when the latter is run into a separate vessel.

A method frequently employed to prevent climbing salts is to smear the upper edge of the cells with paraffin. Still another is to place a strip of oiled cloth around the upper, inside edge of the cell.

In setting up batteries, old solution from an exhausted battery is sometimes employed. This puts the battery in a working condition at once, as it reduces the internal resistance to nearly the normal point; sulphate of zinc being a good conductor. At other times the battery is put on short circuit for twenty-four to forty-eight hours. This also brings the internal resistance down to a working basis, but at a loss of considerable material, since the reduced internal resistance is due to the presence of zinc sulphate in the solution, and this has been formed by the decomposition of a part of the zinc element as well as a part of the sulphate of copper of the solution.

The internal resistance of a battery may be explained thus: While a voltaic cell is a "source" of electromotive force, its elements—the plates, solution, etc.—are conductors and, consequently, like other conductors, possess resistance. In a gravity cell this resistance is from two to three ohms, depending on the size of the plates, their nearness to each other, the nature of the solution, etc. This resistance is called the internal resistance of the cell, in contradistinction to the resistance of the rest of the circuit, which is termed the external resistance. The internal and external resistances comprise the total resistance of the circuit.

Much difficulty, delay and loss is frequently occasioned by the breaking of glass cells, apparently spontaneously, after they have been set up. These breakages are traced to changes in temperature of the battery room. The remedy for this is an improved grade of cell—one that is better annealed.

It has been found of advantage to connect the copper connecting-wire to the copper plate at a point near the bottom of the cell, and to bring the insulated covering of the wire close to that point.

Care should be taken in cold weather to maintain the temperature of the gravity battery above 65° or 70° F., for below that temperature the internal resistance of cells increases very rapidly, so much that even at 50° F. the battery becomes much impaired.

A number of modifications of the Callaud cell have been designed, mainly to prevent accumulations of black copper on the zinc. They differ from the ordinary gravity cell chiefly in the manner of supporting or enclosing the zinc element. In some a porous cup with a flange, or rim, on its upper edge, which rests on the top of the glass jar, is employed, and the zinc is placed in this cup with a few ounces of mercury, the latter for amalgamating purposes. In other respects the elements used are the same as those of the gravity battery, namely, sulphate of copper and metallic copper. In other modifications, the zinc is enclosed in a cloth bag.

(To be continued)

QUESTIONS ON TELEGRAPHY.

Is there any advantage in using the old solution of battery cells in newly set up cells? If there is, explain what it is.

What other means is employed to bring the strength of a new battery up to working condition quickly?

Explain the cause of resistance within a cell—the internal resistance.

If changes in temperature in a battery room sometimes cause battery jars to break, how can the trouble be prevented?

At what temperature should a gravity battery be maintained to give the best results?

Would a low temperature impair the battery; if so, in what way would the battery be affected?

Telephony.

THE RECEIVER.

Fig. 1 shows a standard receiver cut through the middle to show the internal parts. The principal parts are the magnet, the diaphragm and the containing case. The magnet consists of two side pieces (*f*), which are of hard steel permanently magnetized, two soft iron polepieces (*g*), one of which is a north pole and the other a south pole, and which are wound with fine wire (*h*).

The two wires of the telephone line are connected to the fine wire windings so that the electrical waves received from the transmitter at the other end of the line pass around and around the polepieces.

The diaphragm (*i*) appearing in the picture as a straight line because it is seen on edge, is a round, flat disc of thin sheet iron, clamped around the edge by the case but free to vibrate in the middle.

The diaphragm is seen to lie very close to the ends of the polepieces of the magnet. Being of iron it is attracted by the magnet and therefore bends in towards it very slightly.

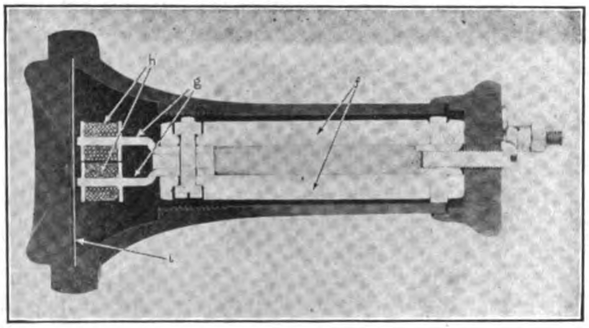

FIG. 1—STANDARD RECEIVER.

If a current of electricity is made to flow through the wire wound around the polepieces, it will either strengthen the magnetic pull and draw the diaphragm a little closer, or if it flows in the opposite direction it will weaken the magnetic pull and allow the diaphragm to spring back a trifle.

Now, the electrical waves coming over the line consist of very minute currents, first in one direction and then in the other, and the result is that the diaphragm vibrates back and forth in tune with the electrical waves. In other words, the receiver diaphragm faithfully reproduces all the vibrations of the distant transmitter diaphragm.

It is apparent that the receiver diaphragm is like a drum head or banjo head and as it vibrates it beats on the air and sends out air waves or sound waves which are in every way similar to the sound waves issuing from the distant speaker's mouth, except that they are not so loud. Therefore, when the listener presses the receiver close to his ear, he hears the speaker's voice just as if he were in the same room.

To give some idea of the very minute currents which are used to transmit speech over a telephone line, the currents which give understandable speech in a receiver at the end of a very long distance line, are something like one five-thousandth of an ampere. From this the currents go up to as much as one hundredth of an ampere, right near a transmitter into which one is talking in a very loud tone. One ampere is about as much current as is taken by two ordinary 16-candle power incandescent lamps.

(To be continued)

Radio Telegraphy

SYSTEMS OF UNITS.—*(Continued)*

The strength or intensity of these two unit currents is not the same; in fact, it is very different, that of the current in the electromagnetic system being 30,000,000,000 times stronger than the unit current in the electrostatic system. The units of the other electrical quantities, as capacity, inductance, resistance, etc., are likewise nearly all different in the two systems, in some cases the units being larger in one system than the other, and vice versa. Owing to the inconvenient size of the units in the two previous systems, suitable fractions or multiples of these units have been chosen as the units of the practical system. It is sometimes convenient to abbreviate the words "electrostatic" and "electromagnetic" to "static" and "magnetic."

When capacity is measured in the practical system the units are the farad and the one-millionth part of a farad, called the microfarad, and in the electrostatic system the unit is the centimeter.

Owing to the large numbers which must be used in converting units from one system to another it is usual to abbreviate as in algebra; thus, 3,000,000,000 is written 3×10^9, where the number 9 indicates the number of times that the cipher or zero must be written after the number 3, and similarly 900,000,000,000,000,000, is written 9×10^{20}.

OSCILLATORY DISCHARGES.

If a strip of steel is clamped at one end and the free end is pulled to one side and released, this end will not only return to its normal position but will swing past it, and returning it will swing past in the opposite direction, but not so far as before and will thus execute a series of oscillations, each of which takes place in the same length of time expressed in fractions of a second, which will gradually die down to zero, or are said to be damped. The free end returns to its normal position because of the elasticity of the metal, and swings beyond it because of its inertia. The energy stored up in the spring in pulling it to one side is thus gradually wasted in friction, etc. In a similar way in electrical circuits we have to deal with capacity which corresponds to the elasticity, and inductance, which corresponds to the inertia.

If a condenser of considerable capacity C, such as a number of Leyden jars or condenser plates in parallel, is connected in a circuit with a coil L and spark gap S, as shown in Fig. 1, and the potential on the condenser gradually increased, quite a large charge may be stored in it before the potential rises high enough to cause a spark at the gap. When, however, the gap breaks down, the charge in the condenser discharges through the gap and the coil, and on account of the inductance (inertia) in the circuit it overshoots in the same way as the spring, then discharges in the opposite direction, etc., so that the charge may oscillate many times back and forth across the gap before it is so used up in heat that not enough charge remains to jump across again.

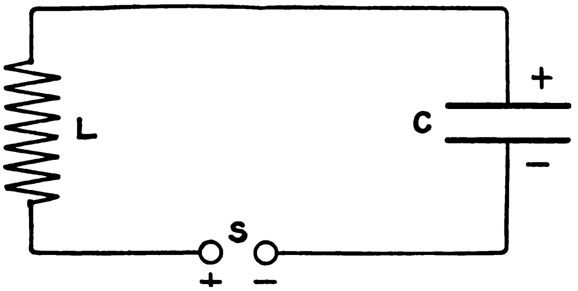

FIG. I.

The charged condenser, as *C* of Fig. 1, is thus the immediate source of the energy of the electrical oscillations. Its rapid oscillatory discharge through the gap *S* and the inductance *L* takes place in the form of a series of decreasing oscillations, called a train of damped oscillations or a damped wave train. In some circuits there may be 20, 30, or even more such oscillations in a wave train. Fig. 2 represents discharges in which the oscillations die down quickly, and are said to be strongly damped or highly damped. Fig. 3 represents discharges in which the oscillations die down gradually and are said to be feebly damped or slightly damped. Fig. 4 represents discharges in which the oscillations do not die down and are said to be undamped oscillations, continuous oscillations, or sustained oscillations. These undamped oscillations can not be generated by the discharge of a condenser through an ordinary spark gap, but may be developed by means of a special type of direct-current arc with metal or metal and carbon electrodes, as in the Poulsen or Federal system, or by special high-frequency alternators, as in the Fessenden or Goldschmidt system. One of these alternators having a speed of 20,000 revolutions per minute and, giving 100,000 oscillations per second has been installed by the Signal Corps at the Bureau of Standards in Washington, D. C. Both the arc and alternator methods of the generation of undamped oscillations are now in use.

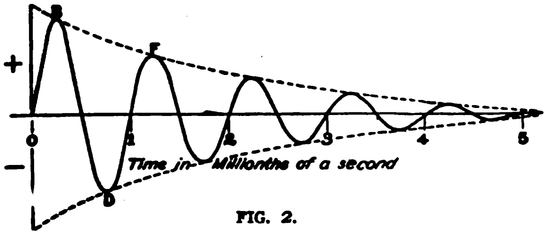

FIG. 2.

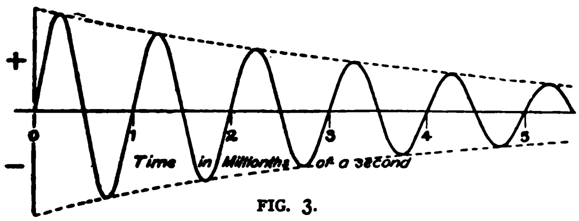

FIG. 3.

(To be continued)

QUESTIONS ON RADIO TELEGRAPHY.

Do electrical oscillations vary in time in making one complete cycle?

What causes the spark gap to "break down" in an oscillating circuit?

In pulling a spring to one side, as described in the first paragraph under "Oscillatory Discharges," what becomes of the energy thus imparted to it?

In an electrical circuit, to what mechanical qualities do capacity and inductance correspond?

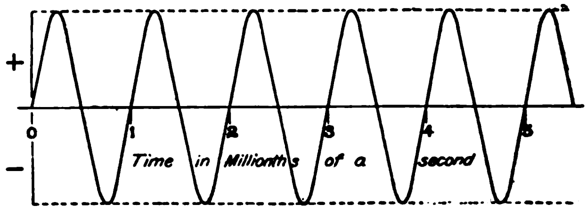

FIG. 4.

When a condenser discharges through an air gap what form does the discharge take?

What are damped oscillations, highly damped oscillations, and undamped or continuous oscillations?

What wireless systems employ undamped oscillations and how are the oscillations generated?

Shop Talk.

BY THE OBSERVER.

I mentioned the sending machine as a little wonder, and no one will dispute that, but there are a few "don'ts" that should be read by all.

Never undertake to use the machine for messages until you can make the Morse characters readable. Practice, they say, makes perfect, therefore devote the proper time to practice before you try to use it for messages. No one who purchased a cornet to learn would think of playing in a band until he was proficient. Then why try the sending machine for business until you can make the characters?

Many young men and women ruin their hands early in the game by attempting fast sending before they are capable of good slow sending, and the same applies to many who attempt to start learning the sending machine by adjusting it at its top speed. They think they are learning rapidly, but in reality they are merely learning how to jumble something a little easier, perhaps, than they did at the start. All of us cannot run at the same speed; neither can all be the "fastest" senders, but all have a chance to be as fast as even a premium circuit demands if they work up to it. It cannot be learned in a jiffy.

Many say: "I wonder how long it will take me to learn to use a sending machine?"

Some learn faster than others. We find this to be so at school, college or the conservatory, but I do most seriously believe that if one will start the use of a sending machine before he "loses his grip" that he will learn quicker and send better than if he takes it up after the hand fails.

I do not mean to say that you cannot use a sending machine after losing your grip. We all know better. The sending machine was invented for men to send with who could hardly make a letter.

Many such men are the top notch senders today, but those who are so proficient with a sending machine, learning after losing their grip, would, as I view it, have been wonders if they had taken up the machine before the nerves of the hand and fingers played out.

I feel that every operator in the service should lend all the assistance possible to their fellow operators, helping them to become skilful machine senders, because there is room for all and the company appreciates and pays well for talent.

The same remarks apply as to helping one to use a typewriter. Many valuable pointers can be given. To all I would say, learn the touch system of using the typewriter.

(To be continued)

Location of Main Operating Rooms.

BY "TEXAS."

The plan for room for chicken and truck gardens set forth in my article in your March 1 issue was not intended to be understood that the company would furnish them, but that with the company locating its main operating rooms far enough on the outer skirts of the city, employes could better afford to purchase larger lots which would otherwise be impracticable on account of distance from their employment. If the company did not see fit to acquire property adjacent to such main office location the employes might form a company and purchase the necessary acreage suitably situated nearby and put into effect the plan mentioned. It is noted that the editor of the AGE thinks this scheme novel and telegraphers few and far between that would be interested in such a plan. I would remind him that the telegrapher of today is far from the same manner of personage that he was in the olden days, when a telegraph job was a telegraph job, no matter where, and the average man remained but a short time at any place. Such men of course had no time for truck patches or chicken raising. It is believed that most telegraphers today will agree with me, that under the new conditions the Western Union plan of taking care of its people, and the multitude of young men engaged by this company, we have a much more settled, contented people who can easily feel that their present employment is worth sticking to and are not thinking of shifting from place to place. The plan suggested does not carry any intimation that any employe would be under any obligations to participate in it; in fact, all of them could not well do so unless several hundred acres were secured. In a city employing upwards of one thousand Western Union people, it would not be a difficult proposition to find one or two hundred that would be delighted to participate in the plan.

Telegraphers are doubtless much more independent today than ever, but it is that appreciative sort of independence which causes each one to consider well before he acts, to measure the cost before he trades.

These are the reasons he is considering investing in a home rather than a tourist's life, and the opportunity is all that he needs to start him along the right road. I am yet a firm believer in the plan suggested.

Communication with Another World.

BY RALPH W. POPE.

A leaf from one of my note books may interest those who are believers and those who are non-believers in so-called spiritual manifestations.

Elizabeth, N. J., January 30, 1907.

Henry Van Hoevenberg* came to my house last evening and spent the night. He told me about table seances at the Lake Placid Club, where he had received many communications from Hank Bogardus through the Morse code. There were two boards in the table so situated that they permitted a "down" and "back strokes." Bogardus first announced himself as "H. B.," but the initials not being understood, he explained that he was Hank Bogardus, and that he died at Chicago, November, 1899. I have not attempted to verify this date statement, which I think is incorrect. [Hank Bogardus died March 26, 1904.—Editor.]

"H. B." answered many questions, while others he said he was not permitted to answer. Many of the predictions he made did not prove correct.

In one case, however, a mental inquiry was made by Godfrey Dewey which he said would be proved on the following Friday. He inquired when a Cadillac tire would be received, and the answer was "on Friday," which eventually proved correct. "H. B." stated that he was detailed to communicate with this sphere, and that where he was everybody worked. The other world, he said, was interwoven with this, but appeared entirely distinct. The Morse characters were generally distinct, but sometimes confused so that it was difficult to read them. "H. B." said he was able to communicate owing to Mr. VanHoevenberg's vitality. Some of the most satisfactory work was done under the supervision of Doctor Funk and Professor Hyslop. Mr. Van Hoevenberg taught the latter the difference between "yes" and "no" in Morse characters, and Bogardus repeated the word "yes" many times, so that the Professor, although a novice, would read the word. Mr. Van Hoevenberg arranged a key and sounder so they could be operated instead of the table, but this gave no demonstration.

Mr. A. E. Stewart of the Western Union Charlotte, N. C., office, has been promoted to the night managership of the Greensboro, N. C., office. Mr. Stewart in renewing his subscription states: "I do not wish to miss an issue of the AGE. My present promotion is due in part to the benefits derived from its columns."

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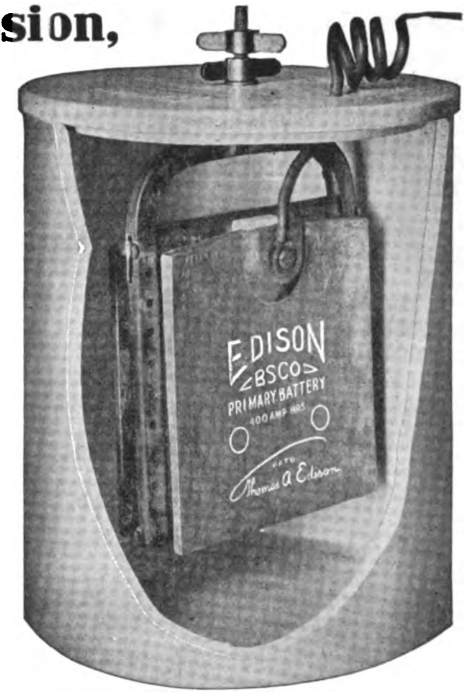
*Mr. Van Hoevenberg was electrical engineer of the Baltimore & Ohio Telegraph Company but left the service when that company went out of existence in 1887, since which time he has resided in the Adirondacks.



Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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THE RAILROAD.

Western Division Meeting.—The date of the postponed meeting of the Western Division of the Association of Railway Telegraph Superintendents which was announced in our April 1 issue for April 19, will take place on that date at the Hotel La Salle, Chicago. A large gathering is expected as many important matters will be introduced and discussed. Mr. E. C. Keenan, chairman of Special Committee No. 6, on telegraph and telephone development, has called a meeting of that committee to be held at the same hotel on April 18 to discuss methods and organize for handling the work of the committee.

Mr. W. J. Canada, electrical engineer, United States Bureau of Standards, Washington, D. C., will address the meeting on the subject of the National Electrical Safety Code which has been issued as Circular No. 54 of the Bureau of Standards, and will discuss, especially, part two of the code which prescribes rules for the installation and maintenance of electrical supply and signal lines.

Mr. H. D. Teed, superintendent of telegraph of the 'Frisco Line, Springfield, Mo., is chairman of the Western Division.

Mr. A. W. Sine, whose appointment to the position of assistant superintendent of telegraph of the Atchison, Topeka and Santa Fe Railway, with headquarters at Topeka, Kan., as was recently announced in these columns, has filled various positions with marked ability. He was manager for the Western Union Telegraph Company at Pendleton, Ore., and then became chief bookkeeper at Seattle, Wash. He left that position to enter the office of Mr. Frank Jaynes, general superintendent at San Francisco. Later Mr. Sine became chief clerk to Superintendent F. H. Lamb at the same place, and afterward occupied a similar position in the office of Superintendent R. T. Reid at Seattle. He re-entered the traffic service in 1910 and was promoted last year to be division traffic engineer, which position he occupied at the time of his recent appointment to the railroad service.

National Electrical Safety Code.—Many companies are voluntarily putting into effect the national electrical safety code, in the preparation of which the United States Bureau of Standards cooperated with leading electrical engineers and representatives of light and power interests, electric railways, telephone and telegraph companies, and manufacturers of electrical goods.

The Fleming Valve an Edison Discovery.

BY WM. H. MEADOWCROFT, EDISON LABORATORY, ORANGE, N. J.

I have lately noticed in many electrical publications descriptions of an apparatus which is called the "Fleming Valve." Permit me to state that this valve was discovered by Mr. Edison in 1884, and was first exhibited by him as a novelty at the Philadelphia Electrical Exposition, which was held September-October, 1884.

Full accounts of this discovery were published in all the scientific periodicals at the time, and at the first meeting of the American Institute of Electrical Engineers, held in Philadelphia on October 7, 1884, Professon Edwin J. Houston read a paper on the subject, and a discussion took place in which the late Sir William H. Preece took part. Since that time the phenomenon has been known in science as the "Edison effect."

It is true that Professor Fleming was the first person to apply the Edison valve to wireless telegraphy, but I think America should receive the credit for the discovery of the valve itself.

Ownership Statement.

Statement of the ownership, management, circulation, etc., required by Act of Congress, August 24, 1912, of Telegraph and Telephone Age, published 1st and 16th each month at New York, N. Y., for April 1, 1917.

County of New York, | ss.
State of New York, |

Before me, a notary public in and for the State and county aforesaid, personally appeared Thomas R. Taltavall, who, having been duly sworn according to law, deposes and says that he is editor of the Telegraph and Telephone Age and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit.:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are

Publisher, John B. Taltavall, 253 Broadway, New York.
Editor, Thomas R. Taltavall, 253 Broadway, New York.
Managing Editor, none.
Business Managers, none.

2. That the owners are:

John B. Taltavall, 253 Broadway, New York.
Thomas R. Taltavall, 253 Broadway, New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

Thomas R. Taltavall, Editor.

Sworn to and subscribed before me this 29th day of March, 1917.

[seal] Henry A. van der Paauwert.
(My commission expires, March 30, 1919.)
Notary Public, Kings County, No. 30; Certificate filed in N. Y. Co. No. 9.

Dot and Dash Club Election.—At the annual meeting of the Dot and Dash Club, held at Philadelphia recently, the following officers were elected: President, C. E. Bagley; treasurer, J. H. Wilson; secretary, R. A. Black.

Efficiency Engineering in the Telegraph Service.

(Continued from page 154, April 1)

We have had considerable to say about service, but the subject is far from being exhausted. In fact, we are asked occasionally to print further details covering service, which are bound to prove both interesting and profitable to the telegraph business at large. One writer wishes to know how it is possible for a manager at one point to bring to the attention of the proper official the poor service rendered by another office which operates to the disadvantage of the service as a whole. A manager does not want to be guilty of pointing out the shortcomings of another office, however costly the mismanaged office may be to the company. Our reply to this is that if a strict supervision is made of all offices the service cannot be permitted to slacken for any definite period. There ought to be a way of checking up delays, and the supervisors ought to experience no difficulty in running down any troubles and complaints arising from this source. It is realized that an enterprising manager at one point is badly handicapped by an indifferent manager located in another city, if the service between the two points is not maintained at a maximum efficiency. It has been well stated that the efficiency of a chain of telegraph offices depends almost wholly upon the weakest link. The office complained of may lack supervision in the delivery department, the receiving department or in the operating room. Perhaps the messenger department needs attention. Supervision is more essential in the conduct of the telegraph in these days than at any previous time. A manager or chief operator should realize that he is the custodian of the company's property, representing an investment of a large sum. Those who have advanced this money —the stockholders— expect an adequate return on their investment. It is the manager's duty to see that the facilities are made to yield the best possible returns. Many officials reason that traffic will come to them whether they ask for it or not. This is true to a certain point. If, however, a manager wishes to increase his receipts over the normal amount that reaches him in daily business transactions, he must work hard for it. It is not sufficient that a manager be content with what comes to him unsolicited. He must reach out for more business.

Ability to hold the position of manager does not always mean success. The appointment was probably made from the ranks. The appointee is untried, and the superintendent experiences anxious moments until he has become convinced that no mistake in the appointment has been made. Upon the manager rests the responsibility for the discipline of the office, the courteous treatment of patrons, the attention they receive over the telephone, and the actions of the messengers. Conditions differ so widely in the various centers that general rules could hardly be formulated to meet every local condition. The successful management of a telegraph plant means that a manager must be everlastingly and strictly attending to business and constantly planning to secure more of it. Improper supervision may undo the hard work of a manager and bring the company into disrepute. There is no other business that depends so largely for its success in annihilating time and space. There is no resting on your oars in the telegraph service.

We often hear it said that such a national bank is maintained at the highest efficiency. The reason is obvious. All its affairs are conducted under one roof. The head official is alive to the importance of maintaining the reputation of the banking institution, which does not depend very largely upon the efficiency or inefficiency of other similar institutions located in other cities. Compare this with the telegraph. However efficient the management in one city may be maintained, if co-operation in other large centers is lacking poor service results. Here is where supervision must assert its usefulness. One operator, one clerk or one messenger boy who has not the company's interest at heart can offset the good work of a dozen other employes. Supervise the service every day of the week, every week of the month and every month of the year and no mistake will be made. Employes, it may be stated as a general proposition, do not intend to place any hindrance in the prompt transmission of the company's business. Things are done, however, that bring about such results, intentionally or unintentionally, and the company is the sufferer.

(To be continued)

Mr. R. Spillane.

Mr. Richard Spillane, a well-known former telegrapher, and a celebrated writer, is one of those individuals who see a great deal in one glance and possess the happy faculty of being able to record the things they see in such an interesting way that all their fellow men enjoy reading their stories. As a telegrapher Mr. Spillane stood in the front ranks, and while his fame was widespread he has become equally famous in literature.

In a recent number of *Questions and Answers on Financial Subjects*, published in New York by Mr. J. Frank Howell, a stock broker, and also a former telegrapher, has this to say about Mr. Spillane:

"As the toastmaster says, 'we have in our midst' one of the most prolific writers of this day—Mr. Richard Spillane, associate editor of *Commerce and Finance*. His adeptness is such that he can sink his artistic pen in deeper and withal to the necessary purpose, with less pain to the patient and without side-stepping on the patient's recovery, than one not familiar with his work might be able to realize. While Mr. Spillane is not a Lone Star, he hails from the State bearing that cognomen—Texas. Neither does he bear the earmarks of one of the chief products of that section—the steer, although closely enough related thereto to be a 'bull' on the country and on his fellow men. His energy is absolutely tireless and some of the marvelous farsightedness of his work would to others portend affluence. His friends still wonder why one so highly endowed should not have been an artist rather than an artisan."

Inventions and Patents.*

BY J. F. SKIRROW, ASSOCIATE ELECTRICAL ENGINEER, POSTAL TELEGRAPH-CABLE COMPANY, NEW YORK.

"Protect your ideas," "Your valuable invention may mean fame and fortune to you," "Millions offered for patents; write to us for list of inventions wanted." So reads a certain class of advertisements, and there is a widespread belief in such statements. It is true that patented inventions have been the basis of some fortunes, just as it is equally true that many fortunes have been founded upon valuable business ideas that are not patentable.

A halo has, however, been thrown around the word "patent," with its government-given monopoly, that leads many to believe that a patent is a short cut to wealth akin to an inside tip on the stock market. The writer detests monopoly in any form, government-given or otherwise, and thinks the whole patent system as at present conducted a fraud upon the inventor, the investor and the public—but that, and his ideas of a better way, are another story. Dealing with things as they are instead of as we would like them to be, let us make a common sense review of inventions and patents as related to our business, so that we may see where we stand.

There are two broad classes of inventions, first, those involving radically new products, such, for instance, as the original patents on the telegraph, telephone, flying machine, etc., and, second, those involving improvements upon inventions of the first class. The patents on inventions comprised in the first class are what are known as basic patents, and those upon inventions in the second class are tributary patents. There are relatively few basic patents and an enormous number of tributary patents.

A novel idea developed to a point where it can be applied to practice becomes an invention and may be patentable. For instance, you may conceive the idea of seeing at a distance by electrical means over a wire, but you cannot patent this idea; you must work out a practical plan for making what you might call this "Teleview" before you can get a patent upon it.

Confusion exists in the minds of many people on this subject. Not infrequently some one claims priority of invention when a patent has been issued for a new thing. Inquiry as to how his device operated brings out the information that the claimant to priority never got beyond the stage of the dream that the thing could be done. The one who explains how is the inventor, not the one who suggests that the thing can be done without explaining how.

If the attorney for the applicant for a patent is able to convince the examiners of the Patent Office in Washington that his basic or tributary invention is novel a patent is allowed, which gives the inventor a monopoly to make, use, sell, or license others to make, use or sell his invention for seventeen years.

Many inventors and patent owners do not understand just what rights a patent gives them. The following may help to make this clear. In the application for a patent the inventor first describes his device and states what he proposes to accomplish that has not been done heretofore and what the advantages are of his improvements. This is known as the specification. He then goes on to say: "What I claim as novel is"; and then follows a numbered list of claims. These claims usually begin with No. 1 claiming "everything in sight." For instance, let us suppose that the inventor has devised a three-handled jug. His claim No. 1 might read, "A receptacle having a multiplicity of handles." If this claim were allowed by the patent office it would mean that the inventor would have the exclusive right to manufacture, etc., all receptacles that have more than one handle. The second claim might read, "A receptacle having three or more handles," and the third claim might read, "A receptacle for liquids having three or more handles equally spaced around its sides." A patent attorney generally starts in with the most sweeping claims possible, and gradually narrows the claims down so that they involve minor details of construction and combinations of details.

When the Patent Office examiner receives an application he examines the patents on file covering similar inventions, and replies to the inventor's attorney rejecting such claims as he sees fit, about as follows: "Your application number —— of John Smith for a patent upon a jug. Claim No. 1 is rejected on patent number —— to Brown, which shows a receptacle with two handles. Claim No. 2 is rejected on patent number —— to Jones, which shows a jug with three handles," and so on.

When the inventor's attorney gets these references (which sometimes include a rejection of every claim made), he either replies objecting to the examiner's decision, arguing that the patents upon which rejections are made do not show the same thing, or he re-writes the claims so as to eliminate those rejected and to narrow down the claims so that he can get one or more allowed.

In some cases the rejection of all claims is final, because no novelty is shown in view of preceding patents. In other cases, after much correspondence between the attorney and the Patent Office, a few claims are allowed which have very little value. For example, referring again to the jug, a single claim might be allowed reading like this, "A receptacle for liquids, of triangular form, having a handle substantially as described in the center of each of its sides, said handles extending above the sides of the receptacle and of hook shape as described and shown in the specification." Such a patent would give the owner the exclusive right to manufacture jugs of his particular design, but a very slight change in the design of the handles would enable any one else to make very similar jugs with three handles without infringing upon the inventor's claims. It may readily be understood that patents of this nature are of no real value.

Now while such a patent might give the inventor exclusive rights to make jugs with three handles of his specified design, if a prior patent has been issued (and has not expired), the claims of which give some one else the exclusive right to make "jugs with three handles," the new inventor cannot make his own kind of jug without permission from the

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*From *Postal Telegraph.*

inventor who has a right to make all jugs with three handles, or until that patent expires by time limitation.

Many inventors having no knowledge of these facts apply for patents upon improvements on already patented devices. They manage to get a few claims allowed on details of no particular consequence and the patent is issued. The inventor thinks he has the right to manufacture the whole device, when, as a matter of fact, all that he has the right to do is to manufacture the detail improvements, subject to the permission of the owners of the patent covering the basic features of the device he has improved (?) upon.

Such inventors, dealing with others as ignorant of the laws as they are themselves, frequently begin to manufacture and sell complete articles, and find themselves in litigation with the owners of the basic or prior patents. The class of patent attorneys who encourage inventors to take out such patents invites this kind of litigation, and they are generally ready to encourage the inventors to go further so that they may swell their fees.

Over a million patents have been issued so far by the United States Patent Office, and a large number of them are of the variety that does not give the inventor the right to make anything without the permission of other inventors. Many such patents are certainly "punk"; they are of no value to either the inventor or the public; only the patent attorney and the government treasury profit by such patents.

Now, as regards patents in the telegraph field. Patents upon inventions of a basic nature which might revolutionize the industry have, of course, to be reviewed from that standpoint. But such patents are few; they may be said to happen only once or twice in a generation. Most inventions in connection with telegraphy involve improvements in small details of construction of apparatus and equipment. When such patents are taken out by the inventors or manufacturers of automatic or printing telegraphs, for instance, these patents may give them the exclusive right to their systems or methods of manufacture, and a group of such patents may thus give one manufacturer a decided advantage over another; that is, the combination of his various improvements may make his equipment as a whole superior to that of another manufacturer. It is also true that a manufacturer of telegraph equipment may patent a single instrument, or a set of instruments, which give him an advantage in the exclusive sale of this equipment.

The patent situation, as viewed from the telegraph company engineer's point of view, is somewhat different. The improved design of apparatus may offer patentable features, but as the company has no interest in selling equipment, there is nothing to gain by investing money in patents on detail improvements, unless these improvements are deemed to be so valuable that it is desirable to prevent competitors from using them. In some instances, because of the extensive use of a small improvement, it may pay the company to invest in a patent. This insures against possible expense for litigation later to establish the company's rights should an outside re-inventor obtain a patent and then try to stop the company from using its own inventions. This, by the way, often makes trouble for inventors who have re-invented something that has been in use but has not been patented by the original inventor. If the user can show use prior to the application for patent by the one who obtained it, the patent becomes invalid.

With the above in mind it may be seen why the company's engineers do not immediately approve every suggestion made by inventors within the service that their devices or improvements be promptly patented. Such patents in many cases would be of the "punk" variety, and in other cases the amount of equipment manufactured under the patent would not warrant investment in the cost of a patent for the very slight risk that the remote possibility of re-invention might involve.

Unless an employe is satisfied that he can sell the use outside of his company of his patent with substantial returns, it saves him money to defer applying for a patent until he ascertains whether the company's engineers consider the invention valuable enough to be used by the company. If the company's engineers cannot see use for the improvement, or the need for taking out a patent, the inventor will usually profit by following their lead. If the invention should be deemed by the company to be worth adoption and a patent, the inventor will have the advantage of the prestige that such adoption gives, and this may result in sales to outsiders that will yield him profit without investment on his part. An employe's standing is, of course, enhanced by any improvements he may suggest that can be used to advantage by the company, whether these improvements are patentable or not, just as usable business ideas suggested by employes improve the standing of the suggestors.

PATENTS.—Important changes have been made in the United States Patent Office during the past year or so which facilitate the issue of patents and decrease the cost to inventors. Any of our clients who wish to obtain patents will consult their best interests by communicating with the Patent Department of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York, on all subjects pertaining to patents and patent litigation. Mr. W. B. Vansize, an experienced and successful patent attorney, and an old-time operator, is in charge of this department.

ELECTRICAL DRAFTSMAN.—The United States Civil Service Commission will hold a competitive examination for electrical draftsman at once. Application blanks will be supplied by the commission at any of the usual examination points.

PROCEEDINGS ISSUED.—The proceedings of the thirty-ninth annual meeting of the Gold and Stock Life Insurance Association, January 15, have been issued officially in pamphlet form. The condition of the association is clearly and succinctly set forth.

Bibliography ot American Journals Devoted to the Interests of Telegraphers and Telegraphy, 1852-1917.

Quite frequently the delver into the literature and history of the telegraph encounters references to original sources of information contained in early telegraph journals. The library of the American Institute of Electrical Engineers, New York, contains copies of many of the telegraph magazines now out of print. Among the few private collections, that in possession of Donald McNicol, New York, is perhaps the most extensive.

The list of magazines which follows, stating the periods during which each flourished, or languished, should be of value to present and future historians in supplying references for the verification of dates, titles of periodicals and names of editors.

The list is fairly complete and the entries are in chronological order:

American Telegraph Magazine. Monthly, 8vo. New York, 1852-1853. There were but six issues of this magazine; the first in October, 1852. Edited by Donald Mann. In March, 1853, this magazine was merged with *Shaffner's Telegraph Companion.*

National Telegraph Review and Operator's Companion. Quarterly, 8vo. Edited by James D. Reid, Philadelphia and New York, 1853-54. Four numbers only were issued.

Shaffner's Telegraph Companion. Monthly and quarterly, 8vo. New York, 1853-1855. Edited by Tal P. Shaffner. Ten numbers issued.

The Telegrapher. 4to. New York, 1864-1877. Published by the National Telegraphic Union. Monthly from October 16, 1864, until August 15, 1867; weekly from August 31, 1867, until August 20, 1870. From the latter date until 1877 *The Telegrapher* was issued weekly, being edited by J. N. Ashley and George Little. In February, 1877, consolidated with *The Journal of the Telegraph.*

Journal of the Telegraph. New York, November, 1868-April, 1915. Published semi-monthly from November 1, 1868, until March 1, 1882; from that date published monthly. The early numbers were of newspaper size.

The Operator. New York, 1874-1885. Published semi-monthly until December 30, 1882, W. S. Williams editor. Weekly as *The Operator and Electrical World,* January 6, 1883, until April 21, 1883: then semi-monthly again from May 1, 1883, until September 19, 1885, as *The Operator.*

Telegraphica. New York, 1873. Edited by Walter P. Phillips. Five numbers issued.

The Switch. Chicago, 1873-1874. Weekly. Edited by Wm. Wallace, Jr.

The Fraternity. Chicago, 1874. Edited by J. W. Strong. Only three numbers issued.

The Electric. St. Louis, Mo., 1875. Semi-monthly; twenty-two numbers issued, beginning with February 1, 1875, issue. J. W. Hayes, editor.

The Magnet. New York, 1880. Semi-monthly. Ten numbers issued.

Other telegraph journals which had a short lease of life during the seventies and eighties were: *The Office Boy,* edited by J. D. Hasbagen and W. H. Eason, New York; *The Plug,* editors, Selden and Mattoon, 1874, published in Cincinnati; *The Wire,* New York, 1899, H. C. Jamison editor, monthly; and one or two others of less note which did not long withstand the withering blight of contemporary appraisal.

The Telegrapher's Advocate. New York, 1883.

Telegraph Age. Founded by John B. Taltavall and John Mitchell. Only a few numbers had been issued when the telegraphers' strike of 1883 took place and destroyed its prospects. In December, 1883, the name of this magazine was changed to *The Electric Age,* and was continued under this name until 1890, under Mr. Taltavall's management. In 1890 the name was changed to *Telegraph Age.* In 1910 the name was again changed to that of TELEGRAPH AND TELEPHONE AGE, under which title it has continued up to the present time.

The Railroad Telegrapher. Vinton, Iowa, and St. Louis, Mo. This journal, the official organ of the Order of Railroad Telegraphers, was founded August 1, 1885, and has continued without lapse up to the present time.

The Message; The Electrical and Mechanical Advertiser. New York, 1890. *The Message,* edited by J. Frank Howell, was issued monthly from March 1, 1890, until February, 1891, when it was merged with *The Electrical and Mechanical Advertiser.* After an existence of about three years the magazine again changed titles and was known as *The Postal Telegraph,* being owned by S. E. Ostrom. After three monthly appearances the magazine was discontinued. J. N. J. Davis was editor.

The Commercial Telegrapher's Journal, the official organ of the Commercial Telegrapher's Union, was founded in 1895 and has continued as a monthly up to the present time.

American Telegrapher. Monthly. Los Angeles, Cal., May, 1914-February, 1916. Edited by Jeff W. Hayes and P. G. Tompkins.

The Wireless Age. New York, 1913. This monthly magazine, which covers the subject of wireless telegraphy, is the outgrowth of *The Marconigraph,* which was first issued in 1901.

Northwest Telephone and Telegraph Review. Minneapolis, Minn., October, 1916. Monthly. R. H. Hanson, P. H. Pauli, editors.

Electrical Pocket Book.

The *Mechanical World* of Manchester, England, has issued its Electrical Pocket Book for 1917. This work of 300 pages includes a collection of electrical engineering notes, rules, tables and data which will be found very useful by the practicing electrical engineer. It is intended principally for electric lighting and power service. Besides the technical and practical information the book contains a diary and space for memoranda for each day of the year. The price of this work is 75 cents per copy, and copies may be purchased of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

MR. JEFF W. HAYES' DEPARTMENT.

Chicago Department.

It is a pleasure for me to present to the telegraph man of the city of Chicago, and to his brother and sister of the middle and far West and South, the space in these columns allotted to me which will hereafter be known as the "Chicago Department."

I will continue my efforts to entertain and amuse our readers by stories of western life and other sketches of human interest.

The serial story, Pleiades Club, will find its usual place in this department and will continue to be of general interest and tone.

Although Chicago will be the feature of this department, these columns will be divided to embrace all happenings in our immediate environment and will cover the doings in the telegraph field of western Canada, the Pacific Coast, the middle West and the "Sunny" South, rendering this space of more than usual interest to all.

Contributions and news items from the broker operator, Associated Press operator, and railroad operator, will be gladly received and taken care of.

This innovation will practically make this journal a Chicago telegraphers' magazine with everything the name implies, although published in New York.

We earnestly hope that our efforts to interest our Chicago patrons will be appreciated and the subscription list from the "Windy City" augmented.

Communications to this department should be addressed to Jeff W. Hayes, Room 620, 111 West Jackson Blvd., Chicago.

The Chicago Postal Office, 1917.

A half century ago Chicago was widely known as the Mecca of the Bohemian operator and it was here that they gathered from all quarters. Many of these Bohemians were gifted, high-class and capable and ofttimes worthy to fill any position of trust in the country. Many of the gentlemen's records still bear me out in this.

The splendid work done by the old time Chicago telegrapher will always form a part of the history of the telegraph. Sentiment can never enter into business and the Bohemian operator of years gone by is rapidly disappearing and there is no nucleus to form a new order built on exactly the same lines.

An entire change has taken place among the Chicago telegraphic fraternity so far as Bohemianism is concerned, and all of that conviviality which existed so many years ago has gone, and gone forever. This is particularly true so far as the Postal Telegraph Company in Chicago is concerned. About a year ago the management served notice upon all its operators that the use of intoxicants must be entirely eschewed and no person smelling of liquor would be tolerated in the office, particularly while on duty.

For many years this office had groaned beneath the weight of worry and grief caused by the pay-day absentees, chief operator and superintendent suffering alike. Alleged remedies, which were inefficacious, were applied but the trouble remained unabated, and the pay-day absentee waxed fat and was ofttimes arrogant. It was considered the height of impertinence for the telegraph management to interfere with the operators semi-monthly vacations. All of this is gone and the management in the Chicago operating room of the Postal Telegraph-Cable Company is responsible for the new era and innovation.

Through the keen insight into human nature possessed by General Superintendent Edgar W. Collins, seconded by the ever-ready captaincy of Manager Thomas N. Powers, an entire change has been effected and the Chicago Postal office of 1917 has no pay-day absentees, and the event of pay-day passes by entirely unnoticed and without a ripple. Of course, it took some work to bring about this result, but every one in this big office rejoices over the change and there is no one who regrets it.

I was told of this by Night Manager Henry Heisler the other evening and I hastened to tender my congratulations to General Superintendent Collins and Manager Powers for accomplishing the almost impossible.

After all is said and done it is to be wondered at what a simple matter it was to bring about this result and with the love for humanity and his brother operator, both Mr. Powers and Mr. Collins will gladly impart the secret, if there is a secret, to any one desiring to uplift the telegrapher, or in fact any one else.

The Pleiades Club.

CHAPTER XI.

The bulletin board, which was the azure blue sky of Mars, contained the names of many new arrivals by fast express train from the terrestrial planet. These bulletins were seared into the bright sky by an electric pen wielded by wireless telegraph, which left an impression plainly visible and legible to all on the planet, and as there is no slumber or tired feeling on the planet Mars, all of its sojourners were on the *qui vive* in anticipation of meeting old friends.

"Ah! there's Nelson A. Buell, of Cleveland, Ohio," cried out A. H. Vanduzer, and instantly the Cleveland fraternity marshalled into line, as one great body, to welcome the arrival of one of its loved members while on earth.

It was easy to recognize the face and form of the former manager of the Cleveland office, with his Napoleonic face, from which radiated love and kindness for his brother man.

There was a long list of friends and former associates to greet Mr. Buell, operators, linemen, clerks and messengers being in the gathering.

Among those assembled to greet the newly arrived were the following:

E. P. Wright, A. H. Vanduzer, Chas. H. Lapp, L. A. Somers, A. J. Desson, Nick Kerver, C. F. Stumm, Geo. T. Lowe, George Phillips, S. B. Roberts, G. H. Wadsworth, E. T. Tindall, O. A. Gurley, E. C. Stockwell, W. R. Williams, Richard Babbitt, D. C. Shull, J. N. McNamara, Marshall S.

Green, Thomas Callahan, John J. McCart, George E. Hinman and his brother Walter, W. H. Eckman, Jas. P. McKinstry, George W. Baxter, Dan R. Francis, Harry Collins, George Melton, George Winston Patteson, Frank G. Beach, W. H. Spencer, Ed Schemerhorn, Hank Cowan, Charlie Phillips, Ed. C. Jenney, Ed. B. Beecher, J. H. Wade, Anson Stager, Wm. Hunter, Charlie Gorham, Hank W. Stager, Tom Miles, Thos. H. Gould and others.

Many telegraph people from adjacent cities were also in evidence and such dear old faces as Zeke Butman, of Fremont, Ohio; Dewitt C. Hill, of Painesville, Ohio; William Bryant, of Erie, Pa.; Ed Burke and P. F. McCarthy, of Sandusky; John A. Townsend, of Dunkirk, N. Y.; Frank Ross and John Owens, of Columbus, Ohio; Henry W. Wynkoop, of Crestline; Wm. Kline, Jr., Charles O. and George M. Brigham, of Toledo, and Mark Luce, of Titusville, Pa.

Mr. Buell's arrival was hailed with much delight and when he announced that the next meeting of the Old Time Telegraphers was to be held in Cleveland, the enthusiasm became greater, for all remembered the previous meeting of that Association in the Forest City in 1886 and the good time everyone had upon that occasion.

"I will never forget the ride to Rocky River," said Mr. Stumm.

"And I will always remember the trip to Put-in-Bay and Kelly's Island," remarked O. A. Gurley.

All of the members had something pleasant to relate and all gave out the hope that their wishes in the matter could reach their former earthly colleagues.

"That matter will be attended to in the highest style of the art, as I will write the subject up and hand it to Fred Moxon for transmission to his earthly partner," said George Hinman, as he proceeded to sharpen his pencil.

Late copies of TELEGRAPH AND TELEPHONE AGE, brought to the planet Mars by Nelson A. Buell were passed around and eagerly scanned and the doings of the Pleiades Club were favorably commented upon.

"While the secretary of the Old Timers, John Brant, is reading felicitous telegrams at the Cleveland meeting from terrestrial friends, I hope it will not be amiss for us to extend our congratulations to that honorable body and I suggest that a committee of the Cleveland Old Timers' now here assembled be appointed to draft a suitable and loving message for our friends to be read on the occasion of the 1917 reunion.

Thus spoke E. P. Wright, and cheer after cheer greeted his suggestion and Gen. Anson Stager, Jeptha H. Wade, Frank G. Beach and Thomas Callahan were appointed such committee, which showed the democratic spirit of the assemblage.

"I believe that I will send a private wireless message to my old friend, Allen A. Briggs and tell him what a nice place it is up here," said Hank Stager and many others fell into line to do the same stunt.

Presidents Garfield and McKinley, both members of the Ohio Society stopped to read the bulletins and to shake hands with Nelson Buell, whom the late presidents remembered particularly well for his ever gentle courtesy when they met in the telegraph office.

"We will watch with keen interest the occurrences at the next Old Timers' meeting, and while not regretting being present, we will extend our hearty congratulations to our worthy brothers in session." This seemed to be the consensus of opinion, heartily expressed, which was handed to Mr. Moxon, with the remark, "More to Come."

And so it appears that the doings of our earthly brothers are being solicitously watched over by those engaged in the same line of business and who have gone before us, and we are never for a moment left alone, even to our innermost thoughts and desires.

The railroad superintendents of telegraph as well as the commercial superintendents are forming an association on the planet Mars and a report of the meeting and the names of those present will be the topic of a future chapter in the Pleiades Club series.

Calgary Canadian Pacific Telegraph Notes.

The beautiful and phenomenal city of Calgary is the pride of the Province of Alberta. It is situated about eighty miles from the Rocky Mountains on the level prairie, which is very fertile and capable of producing the best quality of wheat in great abundance.

The city claims to have eighty-five thousand inhabitants, and everything about its appearance indicates prosperity.

One peculiarity of this region is the abundance of mosquitoes during the summer months. These little pests are only noticeable during the day time, for the nights are too cold for them. It is also worthy of notice that the presence of the mosquito insures a good crop of grain. This is accounted for by the reason that there is considerable moisture to the soil from which the mosquitoes breed, and when this soil is damp a good crop is inevitable. In other words, a good crop of mosquitoes means a good crop of grain, and no mosquitoes means no grain, so the Calgary rancher accepts the mosquito with the best of grace and he is welcome to their hearth.

The Canadian Pacific Railway telegraph office in Calgary possesses the modern conveniences of all kinds and description; there is nothing missing in this office which is in evidence in any other first-class office in the country, excepting perhaps the check girl on roller skates.

It is a most happy office to be employed in and R. J. McInnes, chief operator, with his coterie of assistants, makes it pleasant for everyone. All of the operators are pleased to be employed in this office, and all are enthusiastic and loyal to Calgary and the province of Alberta.

This office has the proud distinction of furnishing the British army with a large number of soldiers, who are all at present at the front; in fact, Alberta has furnished more than its quota during the present war.

Superintendent D. L. Howard is a most pleasant gentleman to meet and he is a man who knows and fills all the requirements of his position. He is ably assisted by T. Duffy, chief clerk; E. H. Goodfellow and C. K. Brown, inspectors for this district.

R. J. McInnes, chief operator, returned from a two months' leave of absence on account of sickness and his coming back was greeted with many marks of satisfaction by his colleagues. He is a quiet, unostentatious gentleman, a good disciplinarian and a true friend.

C. H. Powell is wire chief and the right man in the right place.

Night Chief R. E. Larabee is a counterpart of Mr. McInnes except in personality, and we certainly enjoyed our visit with him.

E. F. Perrin and C. Belton are the traffic chiefs, and their part of their duties is well taken care of, both gentltmen being popular with the force.

H. H. McArthur is a very pleasant gentleman and a fine operator.

J. H. Booth is one of the most popular young men in the office, and is doing good work in his own way to uplift the craft.

John H. Austin is known all over the country, and is a "Joe Dandy." He served for more than ten years on the British mounted police force.

Miss E. J. McLellan is one of Calgary's fairest daughters, who has given up her fiance to serve his country at the front.

Miss J. L. Jodrey is a very fine operator, possessing sweet and gentle ways.

Mrs. Frank Coyle, the daughter of our old friend John Goodfellow, is the wife of Frank Coyle, Associated Press operator. She also is a fine operator and a most pleasant little lady.

C. W. Bassett, formerly of Logan, Utah, has found his way to this city and is ready to tarry here.

E. W. Preston is a jolly good boy, and it does one a world of good to meet and get acquainted with him.

W. S. Taylor, the Morkrum supervisor, is a student and a young man anxious to rise in his profession.

J. H. Bickford is a first-class operator and popular with the force.

R. L. Rigby, better known as "Bobbie" Rigby, is a very pleasant and interesting gentleman whom we will remember with pleasure.

We met our counterpart in C. E. Mansfield, trainmaster for the Canadian Pacific Railway, and the likeness is declared to be striking, and we only hope that we will be considered like him in other respects than personality.

We made several calls on Manager Phillips of this office, but invariably found him out attending to the company's business. We were cordially received, however, by his assistants, and left Calgary very much pleased with our sojourn in that city.

Following is a list of the Calgary officials and force: Superintendent, D. L. Howard; inspectors, E. H. Goodfellow and C. K. Brown; chief clerk, T. Duffy; stenographer, G. Stubbs; chief operator, R. J. McInnes; wire chief, C. H. Powell; night chief operator, R. E. Larabee; late night chief, A. E. Branston; traffic chiefs, E. F. Perrin and C. Belton; Grain Exchange chief, E. M. Wood; Morse operators: H. L. Bucklee, R. A. Kyte, H. H. McArthur, S. T. Smith, C. McKinnon, A. M. Chapman, J. H. Booth, M. S. Reiley, J. M. Forsyth, J. H. Austin, H. A. Cavell, C. E. Parker, E. J. McLellan, J. N. Hayden, W. G. Jackson, I. McKay, K. R. McLean, J. H. McGowan, J. L. Jodrey, N. M. Prentice, H. W. McLean, L. R. Akins, J. S. Hiseler, C. S. Reiley, B. Coyle, G. L. Grubbs, F. R. Bolla, H. J. Howard, H. Palmer, M. E. McNair, F. M. Lytle, S. Bright, C. W. Bassett, F. B. Currie, E. Jones, M. G. McKay, G. Bannerman, C. A. Stevens, J. H. Bickford, E. W. Preston, N. K. Black, R. Fraslin, H. Byam, E. McIntosh, A. F. Todd, A. J. Tonks, R. Rigby, J. B. Lee; Morkrum supervisors, W. S. Taylor and W. E. Avis; Morkrum typists, M. A. Brennen, E. J. Sharkey, J. Buck and C. Hill; timekeeper, R. V. Tombe; branch operators, B. Doyle, S. Bennett and E. A. Miller. G. A. C. Phillips is manager of the Grain Exchange office; E. M. Wood, chief operator; B. Bowser and T. D. Oakes, operators.

Calgary Great North Western Telegraph Notes.

One of the most enterprising young men in Calgary is manager R. W. Ball, of the Great North Western Telegraph Company of that city. Mr. Ball possesses all the requirements of a first-class telegraph manager and he has had an opportunity of displaying his ability at the different offices of which he has been in charge.

Notwithstanding the handicap that besets his office, in being in the rear of the railroad office, his business shows a steady and decided increase over previous months and previous years. Mr. Ball is capable of filling any position in the gift of his company.

Harry E. King is chief operator of this office, and quite equal to any test which he may be called upon to perform.

We were very glad to meet our old friend L. H. Globensky, who works a hundred and sixty acre tract of wheat-raising land in this vicinity during the summer and comes in to make a little "easy money" by working in the telegraph office during the raw winters. His many friends all over the country will be glad to learn his whereabouts. We met the following operators in the Great North Western office here: A. H. Elliott, A. Donaldson, J. J. Dickie, H. O. Pound, M. Sherwin, A. J. Dawson, P. W. Grace, J. W. Lawler, W. Hall.

Personals.

Miss Alice Shanks is the night manager for the Western Union Telegraph Company, at the Union depot, Minneapolis, Minn. She is an excellent operator and a good business woman.

Lawrence Hicks, grandson of the late Geo. B. Hicks, the inventor of the Hicks repeater, has accepted a position with the Postal at Elgin, Ill., as manager. Mr. Hicks recently joined the army of Benedicts and we tender him and his wife our congratulations.

J. T. Spencer, formerly with the Oregon Short

Line at Salt Lake, has quit the road to engage in private business.

D. McReynolds, who, thirty years ago, was foreman for the Western Union at Portland, Ore., and who later became associated with telegraph interests in Texas, is now supervisor of lines at Chicago.

Henry Heisler night chief operator for the Postal at Chicago is assisted by that sterling gentleman, Jos. Weigle, and the night business in this office is handled promptly and satisfactorily.

Chicago Postal Telegraph Bowling League.

The Bowling League of the Postal Telegraph employes meets every Tuesday night at Benziner's, Monroe Street alleys. At the games on April 3 some good scores were made, and all the members are looking forward to the banquet at the end of the season. The results of the games were as follows: First high, three games, operating department, No. 5, 2654 pins; second high, three games, operating department, No. 5, 2586 pins. First high, single game, operating department, No. 3, 926 pins; second high, single game, operating department, No. 2, 916 pins. Individuals, first high, three games, Reblin, 597 pins; second high, three games, O'Day, 596 pins. First high, single game, O'Day, 245 pins; second high, single game, Reblin, 234 pins. The league issues a challenge to any team of five men in the system.

Western Union Bowling League, Chicago.

The second season of the Western Union Bowling League, Chicago, closed with the annual banquet held at the Hotel Sherman on March 29. The decorative scheme was novel and effective, the tables, at which were assembled 160 local employes and officials of the Western Union Company, being arranged to form the letters "W. U. T." A varied musical program was arranged, in which the guests joined under the leadership of Mr. J. M. Long and District Commercial Superintendent Herbert Brown. District Commercial Superintendent A. R. McGrath, as the witty and entertaining toastmaster, led in the spirit of fun and frolic which followed the dinner, calling upon the following speakers, who responded to the toasts listed below: H. Brown, Playing first base on a "Bawling" team, (Note, he is a Glee Club singer); W. McD. Milne, Bowling as one of the Indoor Sports; J. P. Edwards, "Muxing" the alleys; W. W. Watt, Bowling and Plant Juice as aids to health; H. F. Dodge, Keeping up the average; J. C. Nelson, Greetings from the Hoosier State; M. B. Wyrick, Why it makes the alleys (Allies) mad to see a bowler with a "Teuton" (toot on); C. H. Gaunt, Team work at both ends of the game.

In addition interesting addresses were made by President Ralph Taylor and Vice-President C. J. Eldridge, of the Bowling League; also by Messrs. W. I. Lake, N. G. Nelson, W. S. Wood and others, including the guest of honor, Mr. G. Green, president of the New York Bowling League.

At the close of the evening the toastmaster presented to Division Traffic Superintendent J. P. Edwards, a handsome silver trophy cup won by the traffic team, as the champions of the 1916-1917 season. Gold medals were presented to each member of the winning team, including Messrs. B. L. Wilson, L. S. Livingston, G. L. Kirschmyer, J. C. Vleck and E. C. Richter. Cash prizes were made to the division auditors team, Captain C. W. Askelof, accepting; to the commercial team, Captain H. Grevin accepting; to B. L. Wilson, H. F. Grevin, M. J. Blesius, G. L. Kirschmyer, H. L. Hodge (two prizes) and P. Duball. The booby prize was awarded to President Ralph Taylor, who was decorated by Toastmaster McGrath with a large iron cross.

LETTERS FROM OUR AGENTS.

New York Postal.

A short time ago David Simms, of this office, while on his way to Ottawa, Can., was held up for several days by the Canadian government officials because they found on him a Vibroplex which they believed was an infernal machine. After showing that it was simply a tool of his trade and perfectly harmless he was allowed to proceed to his destination. Mr. Simms retains the papers as relics to show why he was detained so long on the border.

Vincent A. O'Connor, service clerk, received one of the bronze medals recently donated by citizens of Brooklyn for military service on the Mexican border.

New York Western Union.

S. B. Haig, division traffic superintendent, and W. E. Stimpson, division traffic supervisor, are in Washington on business connected with the service.

L. A. McIntyre, supervisor of the Commercial News Department, is making an extended business trip through the Southern Division in the interest of the service.

On account of war conditions the dance of the Educational Society which was to have taken place on April 12 has been indefinitely postponed.

The Western Union Educational Society has started giving a series of talks on subjects pertaining to the telegraph, extending from April 4 to August 22. At the meeting of April 4, after an introductory address by S. B. Haig, president of the society, Miss C. G. Eckstrand, assistant chief operator in charge of the New York Telephone Bureau, gave a talk on "Telephone Department." The other talks to be given, and the dates, are as follows: April 18, "Circuit Layouts," by H. B. Mason, engineer, office of vice-president in charge of traffic; May 2, "Tubes and Carriers," by H. W. Morehouse, engineer, office of central engineer; May 16, "Educational Work," by H. B. McChesney, educational expert, office of vice-president in charge of traffic; May 31, "Testing and Regulating-General," by C. W. Frey, general wire chief, office of vice-president in charge of traffic; June 13, "Human Relations in the Telegraph Business," by L. C. Boochever, division traffic supervisor; June 27, "Dispatching," by J. Piccolo, eastern dispatcher; July 11, "Commercial News Department," by H. M. Heffner, assistant chief operator in charge of C. N. D.; July 25, "Multiplex," by R. F. Drehner, division traffic inspector of automatics; August 8, "Clerical," by W. R. Taylor, chief clerk New York main office; August 22, "Employment," by Miss L. M. Park, employment supervisor New York main office.

The sympathy of his numerous friends is extended to John Rathbone, formerly traffic chief in the Southern Division, now retired, in the death of his wife on March 16. Besides her husband she is survived by two daughters and three sons, two of the latter being telegraph operators.

J. H. Montgomery, aged seventy-one years, for over forty years an operator in this office, but who retired on pension about a year ago, died at Passaic, N. J., on March 15.

William G. Magowan, aged sixty-eight years, well known in telegraph circles in Greater New York, having been manager of the Brooklyn offices from 1883 until 1904, died March 30. Since his retirement from the Brooklyn management he had been engaged in other capacities for the company.

Edward Delany, aged fifty-eight years, a well known old time New York telegrapher, died April 11. Mr. Delany worked in several cities of the country but settled in New York City in 1878, since which time he worked in the main office of this company until a few years ago, when he entered the broker service. Mr. Delany was well known to the readers of TELEGRAPH AND TELEPHONE AGE as "The Brevity Man," being a regular contributor to its columns from 1883 until 1900. He had written many creditable verses and he was a writer of ability.

Philadelphia Postal.

The baseball season has begun at the University of Pennsylvania field, with E. M. Price in charge of the Postal interests.

Joseph McDevitt, of 113 Vine Street branch, has been transferred to the main operating room and is succeeded by Harry J. Lewis.

Harry Hertl has been appointed to the printer division nights.

Horace K. Holtzinger, who will be remembered by many as one of Philadelphia's expert telegraphers, was recently appointed pastor of one of the largest parishes of the Methodist Episcopal Church in this city. He is the son of all-night chief operator F. K. Holtzinger.

St. Louis Western Union.

At the last meeting of the Western Union Electrical Society, there was quite an interesting debate by members, on the subject, "Prohibition by Constitutional Amendment." The affirmative was taken by F. M. Sullivan and R. E. Powers, and the negative by L. B. Mayer and W. J. Dill. Honors were even and there was no decision as to which side made the best argument.

On April 19 the Society will give an entertainment and dance. Greater interest is being taken by the members, which has resulted in increasing attendance at the meetings.

Walter Jost, Morse operator, and a naval reserve, was notified to report for duty in the United States Navy. Several operators have been sent from here to other cities, to take the places of men who have been called to the colors in the Army and Navy, which has resulted in a shortage of force here.

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Telegraph and Telephone Age

No. 9. NEW YORK, MAY 1, 1917. Thirty-fifth Year.

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BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, MAY 1, 1917.

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Censorship to be Established.

Censorship of all cables touching the United States and of telegraph and telephone lines into Mexico will be established shortly by the President's order. Regulations formulated jointly by the State, War, Navy and Justice Departments and the new Committee on Public Information were approved April 25 by representatives of the various wire and cable companies.

The cable censorship offices will be at New York, Key West, Galveston and San Francisco, where the cables touch. The navy will direct the cable work, probably with civilian censors, while the army will control the communication lines into Mexico.

Representatives of the French, Commercial, Western Union and other cable companies, including those with lines reaching to South and Central America, were present at the conference.

Cultivate Your Gardens.

President Wilson's recommendation as to the full utilization of the soil by cultivation is a very sensible and patriotic one. The suggestion has taken a powerful hold on those who have gardens, and there never has been such a demand for seeds of all kinds as there is at the present time.

Many telegraph and telephone men own homes in the suburbs of the large cities and they are among the first to show a keen sense of duty to their country by following President Wilson's suggestion. In the raising of vegetables and other farm products, this year particularly, one serves his country just as much as the soldier at the front does, only in a different way.

The country needs many other things besides fighting men. According to English experience during the present war it requires five men at home to provide everything needed by one soldier at the front.

The importance of raising farm produce cannot be overstated. What one can raise on a 25 x 100-foot lot will not cut much of a figure compared with the total amount required to keep the country supplied, but every little helps, and while what one raises in a small way is consumed by the family it lessens by that much the demand on the general supply.

Those who own gardens, large or small, are fortunate and they should not fail to help out in these times of great emergency. They will be reducing the high cost of living, to a small extent at least. Our advice to every telegraph and telephone man who has a small piece of this earth at his disposal is to use it and get all he can out of it for his own benefit and for that of his country.

Officials on Deck.

Telegraph and telephone officials are, like soldiers, sticking close to their duties these days, for they know not what moment the government may call upon them for action. Taking a broad view of the situation, all men engaged in public service corporations are soldiers in a way. Although they are not fighting soldiers, they are service soldiers, and the telegraph and telephone services are of as great importance to the country at this time as are the generals and soldiers who stand ready to protect us from an enemy.

Government Control of Telegraphs and Telephones.

A bill has been introduced in the House of Representatives at Washington giving the President unlimited power to take possession of the railroads and telegraph and telephone lines; to direct their operation and to draft into the military service of the United States and place under military control any and all of the officers, agents and employes of the companies whose lines are taken possession of.

Telegraph and Telephone Patents.

ISSUED APRIL 3.

1,221,238. Phantom Circuit Loading. To J. B. Speed, New York.

1,221,308. Apparatus for Transmitting Impulses of Current in Electric Circuits. To C. L. Goodrum and B. G. Dunham, Rochester, N. Y.

1,221,801. Selective Signaling System. To J. A. Hulit, Chicago, Ill.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on April 26:

American Tel. and Tel. Co.	123⅞
Mackay Companies	84-85
Mackay Companies, pfd.	64½-66
Marconi Wireless Tel. Co. of Am. (Par value 5.00)	2⅝
Western Union	96

PERSONALS.

MR. J. FRANK HOWELL, the well-known stock broker, New York, and a former telegrapher, has been elected president of the Consolidated Stock Exchange of New York.

MR. MITSURU SAYEKI, radio chief engineer, Department of Communications, Japanese Government, is visiting New York.

MR. THOMAS F. SMITH, an operator for the Western Union Telegraph Company several years ago and who later became a newspaper reporter, was elected to Congress from the fifteenth congressional district in New York City, April 16.

MR. ALBERT W. ORTON, of Rome, N. Y., has been appointed a member of the executive committee of the Society of the United States Military Telegraph Corps, vice Charles A. Tinker, deceased.

MR. JAMES P. BRADT, general sales manager of the Columbia Graphophone Company, with headquarters in New York, a former and well-known operator, has been appointed assistant to the president of that company. Since leaving telegraph and newspaper work about twenty years ago, Mr. Bradt has represented the Columbia Graphophone Company in Philadelphia, Baltimore, Berlin, England and Toronto, and has done notable work everywhere for the company.

MR. J. W. LAUGHLIN, a well known member of the telegraph profession in New York and other commercial centers, for the past several years identified with the wireless telegraph service of the United Fruit Company and located at Port Limon, Costa Rica, Central America, has accepted a position with the United States Naval Reserve Force, and is at the present time temporarily located at New Orleans in charge of a special wire to Washington, D. C. Mr. Laughlin expects soon to be transferred to the government wireless department.

All live telegraphers and telephone men are subscribers and readers of TELEGRAPH AND TELEPHONE AGE, which is the only medium that keeps them posted in telegraph and telephone progress. Subscription price $2.00 per year.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

MR. EDWARD REYNOLDS, vice-president and general manager, is again at his office, after an absence of several weeks on business connected with the service.

MR. CHAS. P. BRUCH, vice-president, New York, has been appointed major in the Signal Section Officers Reserve Corps of the Army of the United States, to rank as such from April 16, 1917.

CHANGES IN SUPERINTENDENCIES.—The following changes will be effective May 15: Mr. Alpheus B. Richards is appointed general superintendent of the Pacific Division, with headquarters at San Francisco, vice Mr. Jed G. Blake; Mr. Blake is appointed special agent, Western Division, and will act as assistant to the general superintendent at Chicago; Mr. Solomon H. Mudge, superintendent, is transferred from the first to the fifth district, Western Division, with headquarters at Kansas City, Mo., vice Mr. Richards; Mr. Curtis A. Comstock, superintendent, is transferred from the sixth district to the first district, Western Division, with headquarters at Chicago, vice Mr. Mudge; Mr. Edgar W. Collins, general superintendent, will take direct charge of the sixth district.

HILLER MOROT, aged seventy-five years, an employe in the executive offices of the Postal Telegraph-Cable Company, New York, died April 11.

THE NEW OFFICE AT NEW HAVEN, CONN., will be opened in about two weeks. It will be finished and furnished in the most modern manner, and will be one of the finest offices in the East. Mr. N. C. Hall is the manager.

MR. F. S. LUCE has been appointed manager at Poughkeepsie, N. Y., vice H. K. Perkins, who has been transferred to the managership at Burlington, Vt.

STEVEN H. BUCKLEY, aged twenty-three, manager of the Beloit, Wis., office, died of pneumonia April 13.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

MESSRS. NEWCOMB CARLTON, president; L. McKisick, assistant to the president; W. N. Fashbaugh, vice-president in charge of traffic, and F. E. d'Humy, central office engineer, were in Chicago on April 20.

Report of Employes' Benefit Fund Committees.

The annual report of the Employes' Benefit Fund Committee of the Western Union Telegraph Company for 1916 shows that there were 422 men and 106 women on the pension rolls on December 31, last. There were 1,203 accident cases during the year, very few of them being of a serious nature; 1,673 cases of sickness, and ninety-five deaths—fourteen occurring in the course of employment and eighty-one from natural causes. The number of employes retired on pension since the plan went into effect was 442.

Following is a statement of the fund for the year, not including disability benefits paid employes of the Western Union Cable system:

Amount of Fund January 1, 1916		$1,000,000.00
Disbursements:		
Pensions	$238,934.58	
Accident Disability Benefits and Expenses	55,265.18	
Sickness Disability Benefits	140,164.91	
Death Benefits	73,749.85	
State Insurance	4,300.64	
Total Disbursements		512,415.16
		$487,584.84
Credits:		
Interest at 4 per cent. on monthly balances of Fund	$29,353.64	
Additional contribution by company to restore Fund	483,061.52	
Total Credits		512,415.16
Amount of Fund December 31, 1916		$1,000,000.00

The total disbursements since January 1, 1913, for pensions, accident disability benefits and expenses, sickness disability benefits, death benefits, and state insurance were $1,645,153.09.

The Employes' Benefit Fund Committee consists of F. D. Giles (chairman), Frank Kitton, Lewis McKisick, F. J. McLain and J. J. Welch. Mr. F. T. Albert is secretary.

The report of Employes' Benefit Fund Committee of the American District Telegraph Company (New Jersey) for 1916 shows total disbursements on account of accidents, sickness, pensions and deaths, $14,335.42. Credits: Interest, $3,721.03; appropriation of company's earnings to restore the fund, $10,614.30; total, $14,335.42. Mr. F. T. Albert is secretary of this committee also.

Beefsteak Dinner of the Western Union Bowling Association of New York.

The bowling season in New York had a fitting close Saturday evening, April 14, when the Western Union Bowling Association held a beefsteak dinner.

Previous to the dinner a theatre party was held at one of Brooklyn's leading houses. The arrangements were made by Wm. Lennon, assistant secretary of the company, ably assisted by Wm. Kampf and G. O'Grady.

An enjoyable programme, arranged by J. W. Connolly, assistant treasurer, Wm. A. Wallace and Nat Giffen, was presented throughout the evening.

The address of President Gustavus Green, recently appointed division auditor at Dallas, Tex., was read in his absence. It was the hit of the evening.

Secretary J. A. Hart distributed fifty handsome prizes to the winners in a manner that made everybody think that he was used to handing out prizes.

The evening's entertainment was wound up by the singing of the "Star-Spangled Banner."

Conference. — A conference of managers of offices in the vicinity of Clarksburg, W. Va., was held recently in Clarksburg for the purpose of exchanging ideas and suggesting ways and means of increasing the efficiency of the telegraph service in that vicinity. Mr. A. C. Terry, superintendent, of Pittsburg, presided. Those present were: Managers U. W. Boggess, Clarksburg, W. Va.; W. T. McWhorter, Fairmont, W. Va.; R. T. McCleary, Morgantown, W. Va.; W. S. Grimes, Elkins, W. Va.; O. McGee, Weston, W. Va.; C. C. Schuster, Buckhannon, W. Va., and district commercial managers T. J. Jones and L. L. Leith, Pittsburg, Pa. As a part of a programme laid out by Mr. Terry, conferences will be held in the city every two months. The next conference will be held in Clarksburg, May 17.

Pay of Employes in Military Service.—This company will pay its employes who are now members of the National Guard half of their present salaries while they are in the military service, provided that half pay plus the government pay does not exceed full salary. This order applies to employes who have been in the service of the company for more than a year. The pension provisions and other benefits will continue while these employes are on military duty.

Mr. Preston D. Callum, assistant manager in charge of sales, Baltimore, Md., delivered an address before the senior class of the Annapolis High School on April 5 on "The Romance of the Telegraph." The address was extremely interesting and traced the development of the telegraph from the early days up to the present time.

Mr. E. E. Stanfield has been appointed chief operator of the Helena, Mont., office, vice Mr. C. C. Maxson advanced to the position of assistant chief operator in charge of the multiplex department of the San Francisco office.

Mr. O. A. Carroll, manager of the Cherokee, Iowa, office, has been promoted to a position in the Keokuk, Iowa, office, and Mr. A. A. Arndt succeeds Mr. Carroll as manager at Cherokee.

The National League for Women's Service has sent women to the school of instruction of this company, at 24 Walker Street, to study telegraphy, so as to take the place of men who have entered the military service.

Earnings Report of this company for three months ended March 31, shows total revenues $17,132,187, an increase of $2,781,574 over the same period in 1916; total expenses, $12,912,304, increase $2,099,255; net income $3,886,920, increase $682,319.

The Flag Pole on Western Union Building, New York, is 134 feet 1 inch high from the roof level. It is constructed of steel pipe with air tight joints, suction or vacuum connections. It is of steel and the butt of the flag pole extends through the roof down into the next story, where it is fastened. A collar at the roof level provides the necessary bracing. The building itself is 352 feet high from the curb line, making the top of the flag pole about 486 feet above the sidewalk.

THE CABLE.

RETIREMENT OF JOSEPH FURZE.—The retirement of Mr. Joseph Furze from the management of the Commercial Cable Company at Liverpool, a position which he had occupied since the formation of the company thirty-three years ago, was celebrated in Liverpool recently, when a goodly company, comprising members of the local telegraph and cable world, assembled to do him honor. Mr. J. Wilkinson presided, and among the guests were Col. H. A. Schrank (late Lancashire Fusiliers), Col. A. de Vere Alexander, D. S. O., Col. J. P. Sparling (both late of the Indian Army), and Capt. J. H. L. Richards. R. N. Mr. W. Steventon, assistant manager, presented to Mr. Furze a silver tea and coffee service on an engraved salver as a mark of esteem from the staff of the Commercial Cable Company at Liverpool, while a walking-stick, subscribed for by officials of the Western Union Cable service was also presented to Mr. Furze.

CABLE BUSINESS.—The use of code in dispatches to any part of Cuba beyond Havana is prohibited. Messages must be written in plain language. There are no restrictions on traffic to Havana itself. The following codes are now authorized for use in messages to and from the Philippine Islands; ABC fifth edition, Scott's tenth edition, Western Union, Lieber's, Bentley's not including the separate mining and oil supplement; and Excelsior. The numerical equivalents in these codes and code addresses or signatures are not allowed. Messages must be fully addressed and signed. French, English, and Spanish are the authorized languages. The name of the code must be specified. Deferred cablegrams to Europe, including Great Britain and beyond, are only accepted subject to indefinite delay until further notice.

MR. W. STEVENTON, assistant superintendent, has been advanced to the position of superintendent of the Commercial Cable Company at Liverpool, England, vice Mr. J. Furze, retired.

DAYLIGHT SAVING.—Legal time has been advanced one hour in France, Holland, Portugal and the islands of Azores, Madeira and Cape Verde.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to April 26, 1917, as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable), October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917; Martinique-Paramaribo, April 10, 1917; Cap St. Jacques-Doson, April 13, 1917.

Mr. C. Adams-Randall, the well known inventor of telegraphic apparatus, of Boston, Mass., in remitting to cover his subscription for another year writes: "Your paper is a grand and interesting old friend and I should be grieved to part with him."

CANADIAN NOTES.

MR. H. HULATT, manager of telegraphs, Grand Trunk Railway System, Grand Trunk Pacific Railway, Grand Trunk Pacific Telegraph Company, Montreal, Que., was in New York April 12, 13 and 14 on business connected with the service.

MR. HAROLD A. LOGAN, former manager of the Great North Western Telegraph Company's office in Belleville, Ont., who relinquished his position to enter overseas service, has been wounded.

WORTHINGTON C. SMITH, grandson of Charles A. Tinker, deceased, has joined the Canadian Branch of the British Army at Winnipeg, Man.

Annual Meeting of Great Northwestern Telegraph Officials.

The annual general meeting of superintendents and managers of this company with all head office officials was held at Toronto some time ago. At the conclusion of business a dinner was provided at the Albany Club. An evening session was held at Shea's theatre.

THE TELEPHONE.

MAJOR CARTY IN ACTIVE SERVICE.—Mr. John J. Carty, chief engineer of the American Telephone and Telegraph Company, who holds a first major's commission in the signal officers' reserve corps, has been called into active service. Major Carty is the head of twenty-five complete signal corps companies composed entirely of telephone employes, a large proportion of whom are expert telegraphers. Major Carty is the ranking officer and has been assigned to duty in New York.

MR. THEO. N. VAIL, president of the American Telephone and Telegraph Company, made an address in Washington, April 10, before a special meeting of the National Agricultural Society, in which he predicted an era of greatest prosperity ever known in the United States through small farms. He stated that agriculture now offers probably the greatest opportunity for individual success in all of the country's industries and that the farmer will be the future power in the land.

Extraordinary Telephone Activity.

In submitting the statement of the financial operations of the Bell Telephone System for the first two months of this year President Theo. N. Vail says:

"The first two months show increases in telephone operating revenues of $5,763,000, and in net income of $632,000, as compared with the same months of 1916. The increase in number of stations, both owned and connecting, was over 200,000 in the first two months, and probably nearly 300,000 during the first quarter of the year, making the total number at April 1 about 10,150,000. It is not expected, however, that this rate of increase in stations will be maintained through the year. Coincident with the increase in stations there has been a very heavy traffic, both toll and exchange, which taxes our facilities to the utmost in spite of the unusually large construction programme announced in the annual report and now well under way.

"In addition to the unprecedented commercial requirements the Bell System is actively assisting the government in its military preparations. Military communications will of course take precedence over commercial business and may tend to delay commercial toll calls and the installation of new telephones. There will be serious demands on us, not only for facilities but also for skilled men for the Reserve Signal Corps and other similar services. The absence of other men in the National Guard will add to the difficulties. But the importance to the country of our comprehensive telephone service is so great that we shall spare neither efforts nor expense to meet the demands on us, first for military preparedness and next for the urgent commercial service. While the demands of the government in time of necessity are paramount, the government and all its officials recognize the importance to the country of an efficient service to the public, particularly in these times, and will cooperate with the company in its efforts to maintain regular service. While it may not be possible to meet abnormal demands, we are confident of being able to meet all necessary demands and to easily maintain existing conditions."

TELEPHONE SHAREHOLDERS.—The number of shareholders of stock of the Bell Telephone System on December 31, 1916, not including employes purchasing stock under the plan of easy payments, was 70,555, an increase of 5,043 during the year. The average number of shares held was fifty-six, or deducting the stock held by trustees under the employes stock purchasing plan the average was fifty-four. A majority of the shareholders are women. Forty-three thousand employes of the Bell System in all parts of the country are paying for stock in installments. Adding these to the number of shareholders already given makes at least 120,000 actual owners of Bell Telephone stock.

Modern American Telephony.

A book of real value and service to the telephone student and practical telephonist is "Modern American Telephony," by Arthur Bessey Smith. It covers the subject very thoroughly and so simply that learning about the art of telephony is reduced to the minimum of effort. Following is a partial list of the contents: Installation, operation and maintenance of telephones; direct and alternating currents; pressure, resistance, capacity; magnetos, batteries, switchboards, test and distributing boards; protective devices; measuring instruments; how to find and remedy telephone troubles; line and conduit construction, and automatic systems. There is also a chapter on wireless telephony.

The book has 790 pages and 470 illustrations, principally circuit diagrams, which are very clearly executed. It measures 4½ inches by 7 inches. The price is $2.00 per copy and copies may be obtained of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

A subscription to TELEGRAPH AND TELEPHONE AGE is a good investment. $2.00 per year.

RADIO TELEGRAPHY.

MARCONI NOTES.

MR. E. J. NALLY, vice-president and general manager, and Mr. David Sarnoff, commercial manager, New York, have returned from a business trip to Montreal.

MR. G. S. DE SOUSA, traffic manager, New York, was in Baltimore last week on business of the company.

MR. E. B. PILLSBURY, general superintendent, New York, recently made an inspection trip to the high-power stations at New Brunswick and Belmar, N. J.

RADIO CLUB OF AMERICA.—At the meeting of the Radio Club of America, held in New York, April 20, David S. Brown and W. S. Lemmon presented a paper on "Army and Navy Signaling Systems."

Institute of Radio Engineers to Award a Medal of Honor Annually.

The board of direction of the Institute of Radio Engineers has decided to award annually a "Medal of Honor" to such persons who have distinguished themselves by unusual advances in the fields of radio telegraphy and telephony. The award will be made yearly at the April meeting of the institute to the person who, during the two preceding calendar years, shall have made public the greatest advance in the art of radio communication.

RADIO TELEGRAPHY.—A revised edition of "Radio Telegraphy," has just been issued by the Chief Signal Officer, War Department, Washington. It describes radio telegraphy in a very clear and simple manner and is gotten up principally for the use of the United States Signal Corps. It is probably one of the best books ever issued on wireless telegraphy and is worth having by everyone interested in this subject. It is very completely illustrated with clear and authoritative diagrams. The price is 60 cents per copy. Copies may be obtained of TELEGRAPH AND TELEPHONE AGE, New York.

OBITUARY.

JULES GUTHRIDGE, aged sixty-five years, a widely-known newspaper man in Washington and a former telegrapher, died of apoplexy in that city, April 14. He was connected with the United Press for some time and had a wide acquaintance among public men in Washington.

HOULDER HUDGINS, aged forty-nine years, a former operator and newspaper correspondent, head of Hudgins and Dumas, caterers at Ellis Island, in New York harbor, died April 19. During the Spanish-American War he did some notable newspaper work. He was sent to Ellis Island fifteen years ago by President Roosevelt to handle the food problem there, and instituted many reforms. He was noted as a skilled restaurateur and he frequently fed forty or fifty thousand people in his restaurant at Ellis Island in one day. He started his telegraphic career as a messenger for the American District Telegraph Company, later occupying higher positions in the service. He was private operator for the president of the Baltimore and Ohio Telegraph Company and later entered the Western Union service in Philadelphia, afterward becoming manager of the company's office at Atlantic City, N. J.

JAMES B. BRADY, aged sixty-one years, one of the most remarkable characters in New York and popularly known as "Diamond Jim," died in Atlantic City, N. J., April 13. He was a telegraph operator in his early career. The name "Diamond Jim" was given to him because of his extreme fondness for diamonds and precious stones, the value of those in his possession at the time of his death being almost $2,000,000. He was a keen business man and had accumulated fortunes. He was well known in the night life of Broadway and was an indefatigable first-nighter at most shows. He never indulged in drink or tobacco, however, and had a kind heart. He was always a friend to the needy and had given away millions of dollars. His fortune of $6,000,000 was left almost wholly to charitable institutions.

Death of James R. Mayer.

James R. Mayer, aged fifty-eight years, superintendent telegraph and telephone division of The Texas Company, Houston, Texas, died of apoplexy at his home in that city April 20.

Mr. Mayer was born at East Liverpool, Ohio, and entered the telegraph service as messenger at Cleveland, Ohio, in 1870. After graduating as an operator he worked for different telegraph and railroad companies as well as oil concerns in almost every section of the country. He was well and favorably known to the telegraph profession in general.

After the formation of The Texas Company in 1902, Mr. Mayer was selected to construct a comprehensive system of telegraph and telephone lines connecting the various departments of this extensive oil company.

Mr. Mayer had lately built telegraph and telephone lines in the region of the oil fields near Tampico, Mexico, for his company. He was a valuable official and his untimely death is keenly felt by all who had the pleasure of his acquaintance.

He is survived by his wife and two sons, R. D. and W. R., both of whom are in the telegraph service.

Chicago, Wake Up!

Buy excelsior. It is apparent that TELEGRAPH AND TELEPHONE AGE feels the necessity of continually bringing to the attention of its readers in general the admirable qualities of the Serial Building Loan and Savings Institution of New York. As a resident of Chicago I have read your articles on the excellent service rendered by this Institution during the thirty years of its existence. It makes one proud of the fact that he is a member of the telegraph and telephone professions when he reads that the New York fraternity has almost a million and a quarter dollars invested in this splendid financial organization which is yielding to the investors an annual interest of five per cent., or about sixty thousand dollars per year. It is safe to conclude that the New York fraternity is not carrying all of its eggs in one basket. It is equally safe to assume that it must have invested in homes and in savings banks, stocks, bonds, etc., many additional millions of dollars. In fact, we are given to understand that a thousand operators in the Metropolis have purchased homes through this loan association on easy terms, practically the payment of rent. We all admire the splendid achievements of the Serial.

What is good for New York ought to be good for Chicago. We desire to know why it is that the Chicago fraternity, with its four thousand telegraphers and another thousand telephonists, has not a duplicate of this financial institution. It would pay handsomely in a large center like Chicago and it is to be hoped that some of the enterprising officials of the Western Union Telegraph Company, the Postal Telegraph-Cable Company and the Chicago Telephone Company will wake up to the necessity of organizing a savings and loan institution to further encourage thrift among the employes of these great industries.

The best evidence that Chicago has the requisite material to carry such an institution to success is found in the fact that recently Mr. Thomas W. Carroll, of Chicago, was ordered by his company to New York, where he was substantially recognized by a well-earned advancement. It was noticed that the directors of the Serial Building Loan and Savings Institution instantly concluded that Mr. Carroll was the proper man to assume the presidency of this Institution, which, it is said, has accomplished more to benefit the telegraph fraternity of New York than all other organizations put together. Mr. Carroll is a western man and while duty takes him to New York we have no hesitation in saying that his heart is in Chicago, where he has efficiently labored so many years in the interests of the telegraph industry.

Wake up, Chicago, and let us organize a financial institution in this city that will do justice to the great industries it represents, notwithstanding the fact that its New York brother may have a thirty-year lead. Who will take the initiative?

Mr. A. D. Wetmore, district plant superintendent, Western Union Telegraph Co., St. John, N. B. Canada writes:—"Please accept my thanks for renewing subscription. I would not care to lose any numbers as TELEGRAPH AND TELEPHONE AGE is becoming more interesting each year."

Mr. E. W. H. Cogley, formerly superintendent of telegraph of the Associated Press, and forty years ago well known to the telegraph fraternity of the country for his fine work in sending the Western Associated Press nightly out of New York City, in remitting from Lewistown, Pa., to cover his subscription for another year writes: "Allow me to wish you continued good health and prosperity. I am well along the sunset trail, having passed the seventy-second milestone, but it gives me great pleasure while on the way to read of the many old time friends who still remain with us, and a longing to be with the many others whose names and faces are recalled in the gatherings of the Pleiades Club."

Efficiency Engineering in the Telegraph Service.

(Continued from page 184, April 16.)

Service and supervision go hand in hand in every telegraph office in the world. In the business department of a fairly large office a supervisor noted the fact that three receiving clerks were kept busy taking in telegrams from the public and passing them on to the operating department for transmission, which was accomplished without the slightest delay or confusion. The business office was well organized. A little distance from the receiving department were located the delivery clerks, who were sending forth for delivery from two to ten messages per minute. Bookkeepers and clerks were in evidence everywhere. The manager sat at his desk dictating to his chief clerk in a low tone orders which he wished carried out. The whole office possessed an air of perfect and efficient organization as well as dignity and refinement. No one spoke above a whisper when anyone had something to say to someone else. Each person could concentrate his thoughts on the business that demanded his attention and he was not compelled to listen to what others had to say.

The manager of such an office was well qualified to adequately attend to the duties incumbent upon his position. He was from every point of view a credit to the service. In such an office there is no need of cleaning desks, floors or walls when word is received that the president, the general manager or the superintendent is expected on a visit to the city. The office is on inspection all the time, if not to the officials of the company then to the public, who has a critical and observing eye. In such an office a business man knows that his messages are handled carefully and promptly.

In the business department of another office a supervisor entered unnoticed and, walking over to a desk where there were blanks for the convenience of customers, he pretended to prepare a message. He could see the entire office through the glass partition. He did not view an office such as that just described. A customer was at the moment asking a receiving clerk if he could make a correction in a telegram that he had just a minute or two previously handed in for transmission. The receiving clerk shouted at the top of his voice to someone at the other end of the room who had charge of the tube leading to the operating department to bring back a certain message. There were twenty-odd people in the business office at the time and all of them stopped what they were doing to listen to see if what was said was meant for any of them. This was an unpardonable interruption of business. It required several minutes for the employes to regain their composure and to renew their work where they had been interrupted. This was unnecessary confusion. The receiving clerk should have walked to the distant point in the office and conveyed his message in a low tone to the person he wished to address. The manager sat at his desk with his hat on and the stub of his cigar unlighted lay near the ink bottle. His correspondence and office papers were in a mixed heap. There were papers on the floor. If the delivery clerk spoiled an envelope it was torn in two and dropped at his feet. Messenger boys were allowed access to any part of the business office and were permitted to talk in a loud voice. Whatever anyone had to say caused an interruption in business. Everyone had to listen and hear whether he wished to or not. One clerk would ask for the tariff to a certain point in a voice loud enough to be heard all over the room. The delivery clerk reprimanded messenger boys so that everyone knew what was happening. The result of all this was that at the end of the day not one of the employes had accomplished much more than one-half of the work that he should have done under proper conditions. Efficiency was absent and disorganization was apparent.

A supervisor has no easy task to persuade a manager like the one just described that he is lacking in discipline, efficiency and organization. The manager may even resent the reproaches of the observing official who may point out his various shortcomings. Some managers do not regard matters of this character as material to the welfare of the company. They have been brought up to believe that the easiest way to worry through the day's business is the best way. They know that all in the service have been at their desks fully ten hours but they will not admit or believe that they have each accomplished only five to seven hours' work. Outside of the office a manager may be an ideal representative of the company. In the office, however, he often regards the shortcomings mentioned as too trivial for serious consideration and instantly dismisses all such subjects from his thoughts.

(To be continued)

New Book on Telegraph Instruction.

The sixth edition of "The Telegraph Instructor," by G. M. Dodge, Valparaiso, Ind., has just been issued. It is one of the most complete books of instruction in telegraphy ever gotten up, and every young man or young woman aspiring to be a commercial or railroad telegraph operator should have a copy at hand for guidance.

The book bears evidence of careful preparation of its subject matter, and mastery of it cannot fail to place the student in a position that will be a great advantage to him or her. It tells all about the telegraph—how it works and why it works, and what to do and how to do—from the beginning, in language so clear that the youngest mind cannot fail to comprehend.

Commercial telegraphy is very exhaustively and interestingly presented, as well as railroad telegraphy. The book is illustrated by views and drawings wherever they will aid to a better understanding of the text. There is a chapter on typewriting, giving definite and clear instructions for the use of the typewriter.

The book has been enlarged to 350 pages and is well illustrated. The price is $1.25 per copy. Copies may be obtained of TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

Notable Dinner of the Magnetic Club.

The dinner of the Magnetic Club at the Hotel McAlpin, New York, on the night of April 19, was a memorable one and probably the most successful and enthusiastic ever held by that organization. The attendance was very large and everyone present congratulated President Charles C. Adams on the success of the affair, which was the first to take place under his administration.

Patriotism was the keynote of the gathering and all present entered into the spirit of the occasion with unbounded enthusiasm. The frequent mention of President Wilson's name brought the crowd to its feet and the applause that followed was deeply impressive and sincere, the waving of flags and the singing of patriotic airs winding up each demonstration.

The dinner was made notable by the presence of Hon. James W. Gerard, ex-ambassador of the United States to Germany; Hon. Frederick R. Coudert, the distinguished lawyer, Mr. Clarence H. Mackay, president of the Mackay Companies, and other gentlemen of prominence. When Mr. Gerard entered the room he was greeted with an applause that fairly made the building shake, and he was visibly affected by the greeting.

CHARLES C. ADAMS.

The banquet hall was beautifully decorated with the American colors, in silk as well as bunting, and the coats of arms of the United States and of New York State. Over the dais and on the opposite side of the room American, English and French flags were intertwined, and the profusion of the decorations as a whole produced a most inspiring and beautiful effect.

Every table in the hall was filled to its limit, eight persons being seated at each, and at each seat there was a small silk American flag as a souvenir.

The dinner passed off very enjoyably, and at its conclusion President Charles C. Adams opened the exercises with an able address. After acknowledging the honor of having been elected to the presidency of the club he said there was "no other calling in all human endeavor that affords a higher opportunity for patriotic service to the country in this grave crisis than that of a telegrapher."

"You are," he said, "the soldiers in the army of Instant Communication, without which no nation could survive in war. Without you the Government, the Army and Navy, the trade and commerce of our country, through which the Government finances the sinews of war, would be as helpless as a ship in a storm-tossed sea without rudder and pilot. Our duty, therefore, as patriots, is to remain at our posts in the telegraph offices, and stick to our keys with the determination to make the best efforts of our lives to give our country faithful and efficient telegraph service."

At the close of the address a toast to the President of the United States was drunk.

Mr. Adams then introduced Mr. Gerard, who was received with great applause. Mr. Gerard gave an interesting account of his relations with the German officials, and the things that passed between them, and briefly described the methods of conducting modern warfare. He advocated the adoption of the scheme of compulsory and selective conscription, which, he said, would bring the war to a much earlier termination.

CLARENCE H. MACKAY.

"If we had not entered this war on the side of the Allies," he continued, "we would have been forced single-handed to fight the Germans at the end of the war, and the rest of the world would have looked on with something like applause because we failed to do our part in the war of civilization."

At the conclusion of Mr. Gerard's address the lights were turned out except a flood light upon the stage which played upon an American flag fluttering in a breeze created by electric fans, while the orchestra played and the gathering sang 'The Star-Spangled Banner."

Mr. Clarence H. Mackay was next introduced.

He expressed his delight at having the opportunity to be present at the meeting, and referred to the deaths of George H. Usher, general superintendent at Atlanta, Ga., and John Costelloe, manager of the Cotton Exchange office in New York. "Both were splendid fellows," said Mr. Mackay, "loyal to the core, and with those fine and stable characteristics that stamped the American man and the Postal man."

Referring to the disturbed conditions of the world he said: "If history is accurate, there were gathered at Waterloo about 150,000 troops all told to create one of the great land marks of the world. Today over 30,000,000 men are under arms and more to follow to settle which shall rule under God's skies, autocracy or democracy. We want to see America alert and vibrant, pulsating with patriotism economically and industrially sound, march on triumphantly in the cause of right and not might. For the telegraphers and members of this association gathered here tonight I know there can be one answer to the epoch-making address of the President of the United States. 'Mr. President we will go to the limit of our duty.'"

Hon. Frederick R. Coudert followed Mr. Mackay with an account of the harrowing effects of the war which he had witnessed during a visit to the countries now engaged in the struggle. He also told of a recent trip through the middle West, where he had the opportunity to study the patriotic spirit of the people. Although there were many differences of opinion, underlying all was Americanism. There was no race prejudice—nothing but Americanism. "The people of this country," he said, "are willing to fight for peace."

The last speaker was Mr. Patrick Francis Murphy, a well known New York business man, and equally well known to the telegraph fraternity. Mr. Murphy made a humorous address, and in concluding paid a high tribute to his friend the late John W. Mackay.

Following is a list of those present:

Albany, N. Y.—N. C. Pangburn, W. M. Pruyn.

Atlanta, Ga.—G. W. Ribble,

Baltimore, Md.—J. A. Vogt.

Birmingham, Ala.—A. Klein, W. C. Lloyd.

Boston, Mass.—J. A. Coughlan, G. W. Downey, E. Kimmey, J. D. McDonald.

Buffalo, N. Y.—L. H. Bangert, C. H. Newman, H. D. Reynolds, E. S. Washburne.

Chicago, Ill.—J. Nering, T. N. Powers.

Cleveland, Ohio.—H. E. Patton.

Detroit, Mich.—C. F. Crittenden.

Elmira, N. Y.—J. S. McIntire.

Harrisburg, Pa.—C. E. Diehl.

Indianapolis, Ind.—J. F. Looney.

Jersey City, N. J.—A. C. Ackerman, Fred Ackerman, F. W. Potts.

Long Island City.—Wm. Scarborough, W. L. Woodill.

Newport, R. I.—J. T. Doran.

New York—C. C. Adams, F. G. Austin, C. V. Alvord, J. J. Alcock, J. M. Barry, H. Barkman, F. J. Block, C. P. Bruch, M. W. Blackmar, Jas. R. Beard, T. A. Brennan, E. D. Brewster, H. A. Brinckerhoff, J. R. Cardona, J. J. Cardona, R. Carter, Frank Cohen, W. Commerce, J. J. Cochrane, A. H. Clarke, W. I. Capen, C. W. Crouse, R. N. Cleverdon, W. S. Cleverdon, F. J. Cleverdon, J. F. Cleverdon, S. Cohen, E. A. Coney, Hon. F. R. Coudert, B. J. Conlin, A. Cunningham, R. H. Cherry, M. M. Davis, W. J. Deegan, T. J. Donovan, J. A. Dupuis, W. B. Dunn, J. Doran, F. E. Donohoe, J. J. Donoghue, D. S. Davis, A. J. Eaves, J. J. Fredericks, J. H. Flood, A. A. Frazer, Wm. Finley, E. L. Fiske, H. G. Funk, Hon. J. W. Gerard, E. R. Gailer, M. F. Geigle, R. Gould, J. C. Geigle, D. H. Gage, J. Goldhammer, F. B. Gerrard, J. J. Ghegan, A, Goss, P. A. Hickey, T. E. Hammond, W. S. Hallett, R. J. Hall, H. W. Hetzel, R. L. Hyde, J. F. Henry, L. R. Hallock, M. D., R. Jacobs, H. J. Jenkins, J. Jennings, W. J. Kavanaugh, F. J. Kernan, A. F. Kavanaugh, M. Klepper, A. A. Kramer, L. P. Kearsley, J. F. Kilgour, C. P. Linder, A. Lockwood, C. A. Lane, A. M. Levinson, G. Y. Lewis, C. F. Leonard, B. J. Ley, V. J. Lechesi, F. S. Lockwood, D. F. Lynch, L. Long, Clarence H. Mackay, Patrick F. Murphy, J. A. Manning, C. T. Mallette, R. H. Miller, J. J. Maguire, A. L. Miller, D. F. Mallen, W. J. Mitchell, N. R. Metcalf, C. E. Merritt, H. G. Madden, T. Miller, N. A. Malpas, J. J. Morrison, H. T. Marks, M. Morgan, J. H. Mayers, J. E. Mc Loughlin, H. J. McNally, E. McNally, F. E. Mc Kiernan, D. McNicol, J. F. McNeill, E. P. McCaulder, M. A. McConnell, J. J. McDermott, H. McNamee, G. W. McLaughlin, C. P. McInerney, A. W. McNeill, W. A. McCullough, J. J. McCauley, F. W. McCann, W. J. McNichle, F. F. Norton, J. T. Needham, S. E. Ostrom, M. A. Oberlander, J. P. O'Donohue, C. B. Obst, G. J. O'Brien, F. G. Payne, H. Peters, M. Pertka, J. A. Pinto, Wm. Parylak, A. B. Parrish, Fred'k. Pearce, Walter Price, W. J. Rile, C. R. Ruffer, J. Russo, C. R. Rimpo, C. A. Richardson, W. J. Riley, E. J. Rahtes, F. W. Reed, A. C. Rogero, J. Rhatigan, D. F. Regan, Wm. Restmeyer, P. Relrica, D. Shortall, C. Shirley, J. F. Shugrue, P. R. Shingler, F. J. Sancinatti, F. A. Scheffler, W. B. Schrieber, T. G. Singleton, J. F. Skirrow, Frank Sullivan, Isaac Smith, T. J. Stack, P. Stinbocker, C. C. Shelley, A. Sillman, D. A. Sullivan, Chas. Shirley, Jr., J. Stringham, H. L. Stern, T. R. Taltavall, J. B. Taltavall, T. H. Tierney, E. P. Tully, R. M. Telschow, A. C. Teller, L. O. Toole, J. F. Tynan, E. M. Underhill, J. J. Wallace, J. J. Whalen, C. P. West, W. M. Wolff, Hugo Weise, A. J. Ward, R. E. Walsh, H. E. Wilson, Geo. G. Ward, V. H. Weise, H. R. Waterbury, C. M. White, H. Wier, C. Yacht, H. Zweifel.

Norfolk, Va.—H. A. Lanier.

Pawtucket, R. I.—H. C. Knowles.

Providence, R. I.—G. H. Mills.

Philadelphia, Pa.—C. E. Bagley, H. G. Butcher, W. M. Fitzgerald, J. R. Gorsuch, M. J. Hasson, J. C. Johnson, Robt. C. Mecredy, C. F. Meyers, W. Miley, E. W. Miller, Cyrus O. Moffatt, Samuel Samson, F. R. Sauer, C. E. Stump, J. H. Wilson.

Pittsburgh, Pa.—E. E. Heasley, H. Scrivens.

Reading, Pa.—W. T. Phillips.

Rochester, N. Y.—R. T. Little.

Richmond, Va.—C. H. Ashburn, A. K. Akers.

Springfield, Mass.—P. J. Macken.

Syracuse, N. Y.—J. W. Weed.

Washington, D. C.—G. M. Foote

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions following each department are made up independently of the books consulted and are prepared to enable the student to review his work.

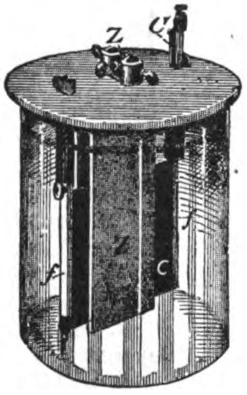
The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

THE EDISON CELL.

This cell, which is a modification, chiefly as to mechanical construction, of the "De Lalande and Chaperon" cell, is illustrated in Fig. 1. Its elements are a zinc plate and a block of copper oxide *C*, upheld by a frame *f*. The solution of the cell is oxide of potassium, or caustic potash, dissolved in water. The plates are suspended from the cover of the cell as shown.

Polarization is prevented by the decomposition of the water of the solution, the oxygen of the water combining with the zinc to form oxide of zinc, which in turn combines with the potash to form an exceedingly soluble double salt of zinc and potash. The hydrogen liberated from the water combines with the oxygen of copper oxide, re-forming water and depositing pure, metallic copper.



EDISON CELL.

The copper oxide is obtained by roasting copper turnings, which are then ground finely and afterwards formed into blocks of suitable size.

To prevent evaporation, and the formation of creeping salts, a layer of suitable oil is placed on the surface of the liquid. This also prevents a combination of dioxide of carbon from the air with the potassium of the solution.

The electromotive force of the cell is low, being at first about .98 of a volt, and after working a short time it falls to .7 or .75 of a volt. The internal resistance of the cell is very low and varies with the size of the cell, the resistance of the largest cell being but .025 of an ohm $\left(\frac{25}{1{,}000}\text{ ohm.}\right)$. The internal resistance decreases after the cell has been in operation for a few hours, owing to the substitution of the reduced metallic copper for the copper oxide; the former being a better conductor than the oxide.

In the Edison cell a film of metallic copper is deposited, in advance, on the copper oxide, thereby ensuring a minimum internal resistance immediately the cell is connected in circuit. The manufacturers advise that, in setting up the cell, one-half the caustic potash sticks, which accompany it, should first be placed in the jar, after which the jar should be filled to within one inch from the top with water. The liquid should be stirred occasionally or until the caustic potash is dissolved, when the remainder of the caustic may be added, the liquid then being stirred as before. This precaution is rendered necessary by the increase of temperature that accompanies the solution of the caustic potash. This solution is harmful to the skin. The hands should therefore be carefully guarded against direct contact with it.

It may be added that the Edison cell is well adapted to purposes requiring strong currents. A cell of this kind having an E. M. F. of .75 of a volt and an internal resistance of .025 of an ohm would, on short-circuit, furnish a current of thirty amperes. A gravity cell having one volt E. M. F. and two ohms internal resistance would furnish a current of but .5 ampere under similar conditions.

QUESTIONS IN TELEGRAPHY.

How is polarization prevented in the Edison battery and what are the chemical reactions in the cell?

What becomes of the hydrogen gas when it is liberated from the water?

How is the copper oxide obtained for use in the Edison cell?

What is the electromotive force of the cell?

What is the internal resistance, and how does it compare with that of the gravity battery?

Why does the internal resistance decrease after the cell has been in use for a few hours?

What is done to the copper oxide plate in order to keep the internal resistance down to the minimum?

How large a current will the Edison cell deliver, and how does it compare with the current delivered by a gravity cell?

Telephony.

THE MULTIPLE TELEPHONE SWITCHBOARD.

In the March 16 issue we described the operation of a small telephone switchboard with one operator, and how she connects the jacks of the different lines by means of flexible cords ending in plugs. In the following article we shall tell how subscribers' lines are connected together for conversation in a large city office, where the thousands of subscribers are divided among many operators.

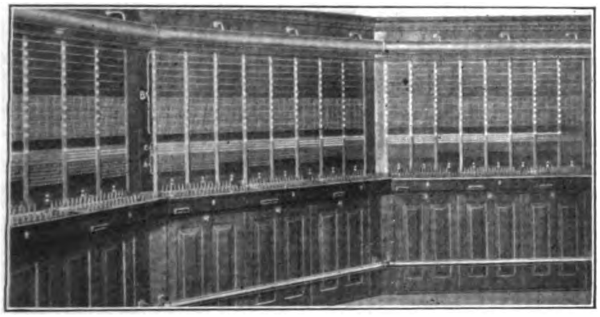
Large switchboards are nowadays practically all of the common battery type, and the following description applies to that kind of switchboard. Its distinctive operating feature is that signals from the subscribers are given by miniature electric lamps, which automatically light and go out when the receiver hooks on the subscribers' instruments are moved up and down.

The operators sit in a row along a continuous switchboard and in front of each operator are jacks for about two hundred lines. These are called answering jacks, and under each one is a small lamp called a line lamp, which lights when that subscriber lifts his receiver from the hook to ask for a number.

In the keyboard in front of each operator are pairs of cords, each with its ringing and listening key lever, similar to those in the small board. There are also two small lamps called supervisory lamps placed between each pair of cords and their key. The back lamp is associated with the back or answering cord and plug, and the front lamp with the front or calling cord and plug.

Now suppose your telephone number is No. 999, and that you take up your receiver to ask for No. 4321. At once the line lamp under answering jack No. 999 lights, and the nearest operator places the answering plug of any one of her pairs of cords in the jack, presses back the key lever, and asks "Number?" You say "4321."

Now answering jack No. 4321 may be way at the other end of the board, out of your operator's reach, so to enable her to connect to line No. 4321 without asking another operator's assistance, there are provided the multiple jacks which give the switchboard its name of multiple switchboard.



EIGHT THOUSAND LINE MULTIPLE TELEPHONE SWITCHBOARD.

The upper part of the face of the switchboard for its whole length is a solid mass of jacks, numbered in groups of say 10,000 (if there are 10,000 lines connected to the switchboard). Each group fills the space in front of three operators, and if we look in a certain place in every group we shall find one jack in each group numbered 4321. All the multiple jacks of the same number are connected together and to the answering jack and subscriber's line of the same number, by means of cable in the back of the switchboard.

Your operator is, therefore, able to find a multiple jack numbered 4321 either directly in front of her or within reach on one side or the other. She places the calling plug of the same pair of cords in that jack and pulls the key lever towards her, to ring subscriber No. 4321's bell.

Before plugging into the multiple jack, however, she must first make sure that line No. 4321 is not already in use, as some other operator may have a plug in one of its other multiple jacks or its answering jack. To tell this, she makes a "busy" test by tapping the point of the calling plug several times against the edge of the multiple jack. If the line is disengaged she will hear nothing, but if there is a plug in any one of the other jacks of that line she will hear a sharp click each time she taps the jack.

We will now describe the action of the supervisory lamps. When the operator plugs into multiple jack No. 4321, the front lamp of the pair of cords lights. When it goes out the operator knows that subscriber No. 4321 has answered and she need not ring again. The back lamp has not yet lighted.

When the conversation is finished and you both hang up your receivers, both the supervisory lamps light, telling the operator to pull down the cords, as the call is finished.

If either you or subscriber No. 4321 desire to get the attention of the operator while you are still connected, a slow up and down movement of the receiver hook will light and extinguish one lamp or the other as long as you keep it up, and that notifies the operator to press back the key lever and ask what you want.

The illustration shows part of a switchboard where it is rounding a corner of the operating room. In the space marked "A" are the answering jacks and line lamps; the multiple jacks are in the upper part, marked "B"; and in the space marked "C" are jacks used for connecting to other central offices.

It will be seen that in each straight section there are keyboards for three operators and a complete equipment of multiple jacks for 4000 lines, with space above for more multiple jacks up to the total capacity of 8800 lines, which is the limit of this particular switchboard.

The multiple jacks are in groups of 100, with a number plate at the left of each group, and the jacks in each group are individually numbered from 0 to 99.

QUESTIONS ON TELEPHONY.

Of what type are large switchboards—the magneto or common battery?

What is the distinctive operating feature of the common-battery type of switchboard—that is, how are the call signals from subscribers indicated at the switchboard?

How many lines does each operator control?

What are the supervisory lamps used for?

What are multiple jacks on a switchboard?

How does the operator ascertain whether a desired line is already in use?

What is a "busy" test?

Radio Telegraphy

FREQUENCY.

The rate of vibration of a steel spring or number of vibrations per second depends upon the weight, distribution and elasticity of the metal. Similarly in the electrical circuit, when the condenser discharges across the gap and through the inductance, the rate of the electrical oscillations, or frequency in number of oscillations per second, depends upon the capacity of the condenser and the inductance of the coil. The larger the product of the capacity and inductance, the slower is the rate of the oscillations; that is, the fewer the number of oscillations per second and the lower the frequency, and vice versa, the smaller the product of the capacity and inductance the more rapid is the rate of the oscillations; that is, the greater the number of oscillations per second and the higher the frequency. The formula for the number of oscillations per second is $n = \frac{1}{2\pi\sqrt{LC}}$, where L is the inductance in circuit in henrys and C the capacity in farads; thus, if C is 0.000,000,004 farad (0.004 microfarad) and L is 0.001 henry (1,000,000 cms. or 1 millihenry), then the oscillations are taking place at the rate of about 79,600 per second.

$$n = \frac{1}{6.28\sqrt{0.001 \times 0.000,000,004}} = \frac{1}{6.28\sqrt{0.000,000,000,004}} = 79,600$$

RESONANCE.

The principles of resonance can be illustrated by the steel spring, preferably in the form of two tuning forks. If a loud note from one tuning fork is sounded near another fork, the latter will be set in vibration slightly, even if the pitch of the note or number of vibrations per second is not the same as that which the latter itself would give. If, however, the note is of the same pitch, then each successive vibration of the prongs will be re-enforced by air waves of the same frequency as its own, and stronger vibrations will be produced by this note than by any other. Under these conditions the two forks are said to be in resonance. Similarly if a circuit containing a coil *l*, condenser *c*, and very small spark gap *s*, all in series, is brought near another crcuit *LCS*, as shown in Fig. 1, in which oscillations are taking place, then small sparks may be seen passing across the gap *s*, of the first circuit, showing that currents are being induced in it. If, however, adjustments are made in the number of the Leyden tubes in circuit or in the number of turns of inductance by means of the sliding contact, then generally the size and brightness of the sparks will be increased up to a certain point and any further changes in either the inductance or the capacity will make the sparks smaller and fainter. At the adjustment which gives the largest and brightest sparks the induced oscillations are the strongest and of the same frequency in the two circuits; that is, the two circuits are syntonized, or tuned, or are in resonance.

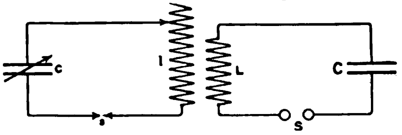


FIG. 1.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

Upon what elements does the frequency of electrical oscillations depend?

What is the formula for ascertaining the number of oscillations per second in a circuit?

How can the principles of resonance be illustrated?

If a tuning fork is sounded near another fork will the former have any effect upon the latter, even if the pitch or note of the two forks is not the same?

If the pitch or note of the two forks is the same what happens when one fork is sounded near the other fork?

If a circuit containing an inductance, condenser and small spark gap, connected in series, is brought near another similar circuit in which oscillations are taking place, what happens?

What is meant by the terms syntonizing or tuning; what is the condition of the circuits when they are in tune, and how is this condition indicated?

Shop Talk.

BY THE OBSERVER.

On all trunk circuits, including those wires between the larger offices, and at smaller independent offices, also way offices that do a good amount of business, operators will be found that are capable for every condition.

Whenever it is found that there are some who are not capable of the heavy task a proper report to the traffic supervisor will bring about a change. Now the joint offices along the railroads supply operators that are capable of the demands placed upon their respective stations, but it is no more fair to expect these men to be able to handle the business at high speed than it is to expect a stenographer with little experience to act as a court reporter.

It is quite true that there are some that can do it, but they are few. Therefore if operators at the smaller offices break frequently do not become angered, but reduce your speed, which will fortify them, and notice the good results.

Whenever I hear an operator losing his temper under such circumstances, and calling the receivers hams, etc., I feel a certain sense of pity for the sender. Possibly it was only a short while since he was a ham himself and if he had had no more practice than a lot of the railroad boys he would still be a ham.

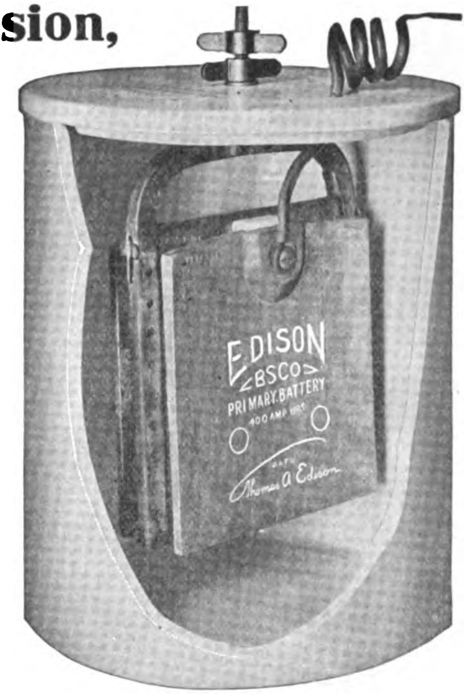
Many of the railroad operators are well read; their reports and general efficiency as regards the major portion of their duties being highly appreciated by the railroad officials. They are certainly entitled to more consideration by main office operators than is sometimes shown. I know of several cases where railroad operators could not receive over twenty words a minute, but they could make any patch at the switchboard the wire chief called for. How many of those that yell "ham" can do that? Do not use invectives. Whenever you feel that an operator is incompetent notify the proper supervisor and let him handle the matter.

Many good men subtract the best out of their work by sullenness, outbursts of temper and blasphemy. Either trait is bad enough, but there is no place for blasphemy on, or off, a telegraph wire.

(To be continued)

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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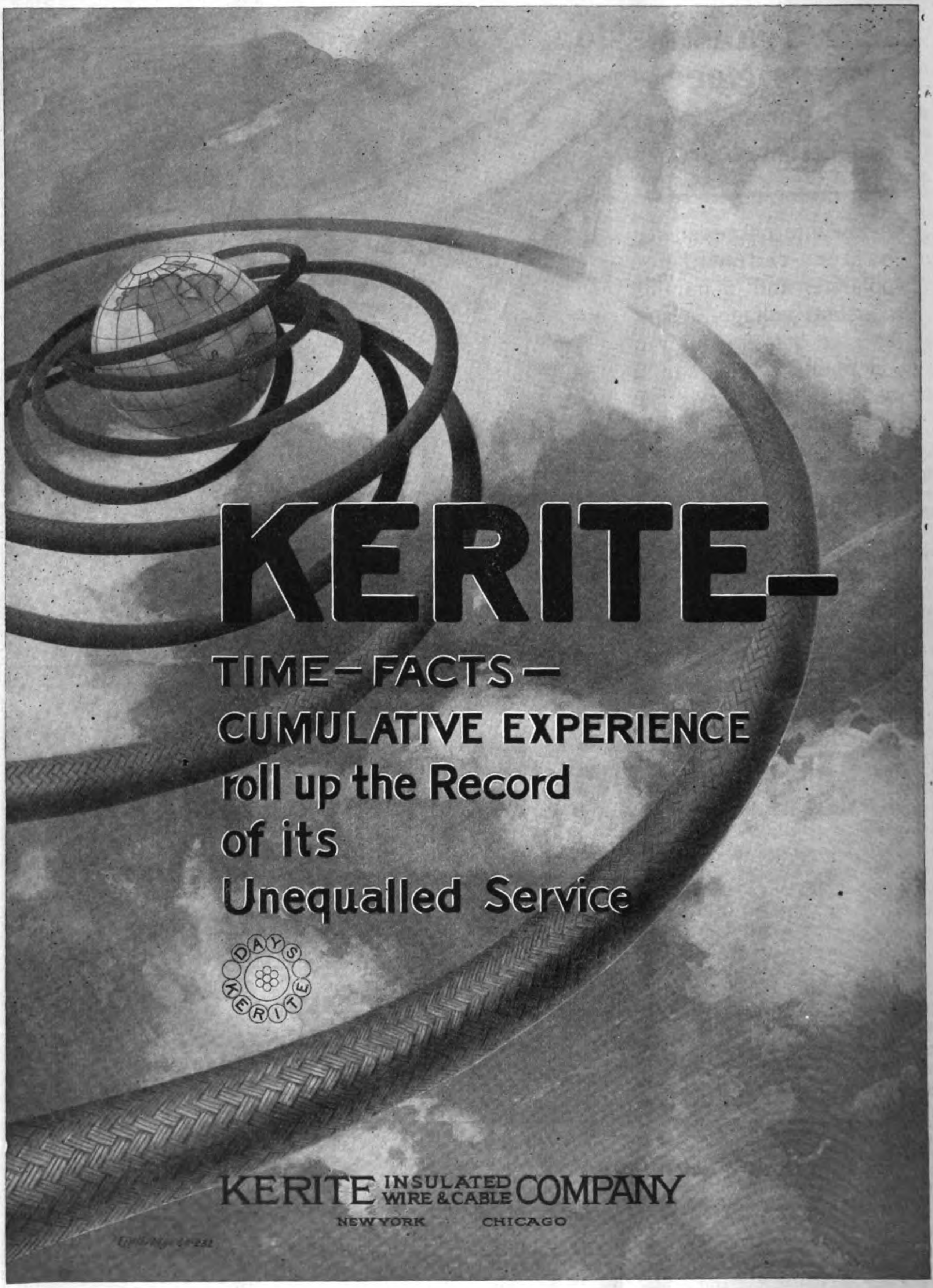
GILL SELECTOR

THE UNIVERSAL SELECTOR FOR TELEGRAPH AND TELEPHONE



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TIME—FACTS—
CUMULATIVE EXPERIENCE
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THE RAILROAD.

Meeting of Western Division, Association of Railway Telegraph Superintendents.

A well attended meeting of the Western Division of the Association of Railway Telegraph Superintendents was held at the LaSalle Hotel, Chicago, Wednesday and Thursday, April 18 and 19. On Wednesday the several special committees held meetings, formulating reports, etc. On Thursday the general meeting was held, at which time the various committee reports were considered.

There were about one hundred members in attendance, the representation fairly representing all sections of the country.

At Thursday's meeting, General Manager Gaunt of the Western Union Telegraph Company addressed the members on co-operation as affecting business between the railroad and telegraph company.

One of the most important business matters considered was the discussion of Circular No. 54, issued by the United States Bureau of Standards, covering the National Electrical Safety Code, which among other things includes recommended rules to govern crossings of signal wires or telegraph and telephone wires over railroads, being referred to in the code as Grade "D". The discussion brought out the fact that the code rules covering this grade of construction, or low tension wires for telegraph and telephone purposes, were practically a copy of the Association of Railway Telegraph Superintendents specifications for crossings of wires or cables of telegraph, telephone, signal or other wires of similar character over steam railroad rights of way, tracks or lines of wires of the same classes, adopted at the St. Louis convention in 1913, and later approved by the American Railway Association, the Western Union Telegraph Company, the American Telephone and Telegraph Company, and other wire using concerns.

These specifications and the Bureau's code follow the practice which has existed for a great many years, of arbitrarily specifying the length of span and size of poles. The discussion brought out the fact that a definite strength was not provided by such rules and the method does not appear to be consistent with a safety code. The rules recommended by the Bureau of Standards for the high tension wires provide a definite strength to be figured in accordance with engineering methods, starting with a proper assumed load and allowing a proper factor of safety; in other words, it is a well known fact that in certain territory sleet forms on wires so that it frequently makes a one half inch coating of ice. It is also known and recorded by the Weather Bureau that the wind velocity frequently ranges as high as seventy miles per hour and over. When this high wind velocity prevails at the same time that the wires are covered with a half inch coating of ice, the pole line is called upon to carry the pressure exerted by this wind on the ice coated wires. It is well known what strength can safely be borne by various grades of timber or steel, concrete or other engineering construction material. Therefore, with the definite knowledge as to the ice on wires, wind velocity and the strength of timber, steel, etc., it is a simple mathematical problem to determine how strong the poles and wires must be to resist without failure the wind and sleet storms or the loads they are called upon to bear.

Mr. William J. Canada, electrical engineer, representing the National Bureau of Standards, agreed that the Bureau was not satisfied with that part of the code which specified the strength of the poles at railway crossings for Grade "D" construction, or telegraph and telephone wires, admitting that there was an inconsistency between Grade "D" construction rules and the high tension construction, but explained that the Bureau was persuaded to adopt the rules given in Grade "D" because of their general use by telegraph and telephone companies. However, from the discussion at this meeting it is thought that the Bureau will take up the question of providing a more definite strength for poles and wires crossing railroad tracks, as well as those located within striking distance of railroad tracks and Committee No. 1 of the Association intends to co-operate with the Bureau of Standards in efforts to make advance which will bring stronger pole lines and wires so that the failures which now frequently occur during heavy sleet and wind storms will be eliminated.

In the report of Special Committee No. 6, Telegraph and Telephone Development, reference was made to a recent development which shows that when a large number of way station offices are listening in on the dispatcher's telephone circuit the transmission is greatly reduced. While heretofore it was thought that the 650-ohm telephone receivers generally used in such service were sufficient to avoid weakening transmission when several offices listened on the line at the same time, it developed on the Big Four Railway during the heavy traffic last fall when there was a freight train on every siding along the railroad waiting for orders all of the way station or block offices were listening, which very materially weakened the telephone transmission. This loss, however, was overcome by using telephone receivers wound to a resistance of 1,500 ohms.

The use of these high-wound receivers on several divisions where the traffic is heavy and an unusual number of offices are on the telephone circuit at the same time shows that the loss in transmission is eliminated. In this connection it was brought out that an arrangement will soon be made so that by use of proper coils, which will place the proper impedance on the drops at the way stations, the transmission loss can be overcome by using a low wound receiver as at present and also increase the transmission somewhat over the method by which the loss is avoided by using the 1,500 ohm receivers. This feature was very interesting to the members, as it opens a path for the clearing up of some troubles which have occurred on heavily loaded telephone dispatcher's circuits that was not previously known.

A resolution was passed pledging support to the President and offering to assist in any way possible for the successful termination of the war.

On account of the annual meeting of the Association which was to be held in Washington, D. C., September 18, 19 and 20, falling on the same dates that the Signal Engineers meeting takes place at Atlantic City, which interferes with the associate members, or the supply men, attending both conventions, as they wish to do, the Executive Committee of the Association of Railway Telegraph Superintendents has changed the date of the annual meeting to September 11, 12 and 13. The meeting is to be held at the Hotel Raleigh, Washington, and from the advance reports of the special committees it is certain that a very interesting business programme will be carried out.

Among those present were:

Albany, N.Y.—J. J. Rounds.

Chicago, Ill.—Wm. Bennett, J. C. Binning, J. R. Blackhall, E. A. Burkitt, J. O. Carr, O. F. Cassaday, W. L. Cook, D. R. Day, P. W. Drew, J. P. Edwards, John H. Finley, C. W. Fraher, A. G. Francis, C. H. Gaunt, G. A. Graber, G. D. Hood, W. H. Lienesch, J. M. Lorenz, E. A. Patterson, G. O. Perkins, W. R. Pflasterer, R. W. Potts, H. O. Rugh, H. H. Simmons, F. H. VanEtten, W. W. Watt, F. T. Wilbur, W. S. Wood, C. A. Worst, A. Wray, M. B. Wyrick.

Cleveland, Ohio—A. Behner, R. F. Finley.

Decatur, Ill.—J. P. Church.

Denison, Tex.—W. H. Hall.

Denver, Col.—F. A. Cannon.

Detroit, Mich.—J. J. Ross.

Gibson, Ind.—W. L. Connelly.

Indianapolis, Ind.—C. S. Rhoads, Stanley Rhoads.

Kankakee, Ill.—H. C. Hewes.

Lincoln, Neb.—H. A. Vaughan.

Memphis, Tenn.—J. E. Drewry, Horace Johnson.

Milwaukee, Wis.—A. C. Adams, A. A. Birler.

Minneapolis, Minn.—L. H. Merrill.

Montreal, Que.—L. E. Bell.

New York—B. A. Kaiser, E. C. Keenan.

Omaha, Neb.—W. P. McFarlane.

Pittsburgh, Pa.—G. A. Cellar, G. A. Dornberg.

South Bethlehem, Pa.—J. F. Caskey.

St. Louis, Mo.—S. P. Casey, E. A. Chenery, A. F. Eyermann, W. Rogers.

St. Paul, Minn.—M. H. Clapp, H. C. James, J. C. Rankine,

Springfield, Mo.—J. H. Brennan, H. D. Teed.

Topeka, Kan—H. C. Chace.

Valparaiso, Ind.—G. M. Dodge, E. F. Rainier.

Washington, D. C.—W. J. Canada, Howard S. Phelps.

Underground Cable Work on the Pennsylvania.

The underground cable being laid on the New York division of the Pennsylvania Railroad is now in service as far west as Millstone Junction, just west of New Brunswick, N. J., a distance of thirty-two miles. The construction of the section between Millstone Junction and Princeton Junction is also under way, an extension of fourteen miles. On the Philadelphia end of the circuit the cables are in service underground to North Philadelphia, about 5.5 miles.

Two telephone cables are in service throughout this distance, one being used for trunk or through circuits and the other being used for the division trunks and the local service.

The number of wires varies in different sections, depending upon the requirements. In general, however, the trunk cable includes twenty pairs and the local from thirty to fifty pairs.

The local signal circuits carrying low voltage are in cable in one of the ducts and racked on the opposite side of the manholes, away from the telephone cables.

The high-tension signal line (2,300 volts, 60-cycle) is carried in trunking outside of the conduit and around the manholes, there being no connections in the conduit system or in the manholes carrying this higher voltage.

Mr. J. C. Johnson is superintendent of telegraph of the Pennsylvania Railroad.

Change of Dates of Meeting of Association of Railway Telegraph Superintendents.

The dates of the annual convention of the Association of Railway Telegraph Superintendents, which will be held in Washington, D. C., have been changed from September 18, 19 and 20 to September 11, 12 and 13. This change was made on account of the conflict of dates of the meeting of the Signal Engineers at Atlantic City. The convention will be held at the Hotel Raleigh, Washington.

MESSRS. J. C. JOHNSON, superintendent of telegraph, Pennsylvania Railroad, Philadelphia, and F. G. Adams, circuit manager, Baltimore and Ohio Railroad, Baltimore, Md., were recent New York visitors.

S. B. RUMSEY, aged seventy-one years, an old-time railroad operator, and a member of the Society of the United States Military Telegraph Corps, died at Oakmont, Pa., March 18.

Civil War Telegraphers to Aid Government.

Col. William Bender Wilson, president of the Society of the United States Military Telegraph Corps, has addressed a letter to the Hon. N. D. Baker, Secretary of War, Washington, D. C., suggesting that in order to effectively avail of the present offer of the surviving members of the corps to aid the government, and in recognition of their Civil War service, the War Department order their enrollment under oath, also their sons and grandsons, in a special reserve corps to be designated, for instance, "The Civil War Military Telegraphers' Corps" under the immediate command of Col. Wilson and David Homer Bates, president and secretary, respectively, of the Society, to serve without pay under the supervision of the War Department.

MESSENGER BUREAUS TO BE LICENSED.—A bill has been introduced in the New York legislature providing that any individual or concern desiring to conduct a messenger service bureau must first obtain a license from the State Comptroller.

How to Clean and Oil a Gill Selector.

The present day Gill selector is the result of many years of experiment to devise a mechanism that would withstand the severe wear to which such apparatus is subjected, especially in telegraph service. The result of these experiments has been to prove again the accepted mechanical principle that to reduce weight is to reduce wear, and the light moving parts used in this selector were designed in conformity with that idea. In order to eliminate the possibility of excessive wear due to unncessarily heavy operating currents all of the movements in the Gill selector mechanism are effected entirely by the force of gravitation. A simple electromagnet is used merely for the purpose of lifting a weight and allowing it to fall. The falling of this weight supplies all of the energy necessary to drive the selector, and it is needless to point out that although an excessive current in the electromagnet may raise this weight with extreme violence, the weight will always fall with exactly the same force and the wear on the selector parts will not be increased. Even the violent raising of the weight is rendered impossible in telegraph selectors and also in telephone selectors that operate the bell from the main battery, and in selectors of these types all of the movements without exception are entirely independent of the current strength.

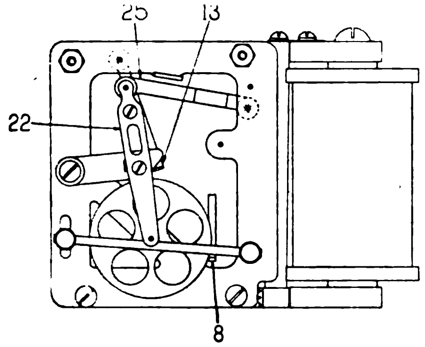


FIG. 1—TIME WHEEL UP THE TRACK.

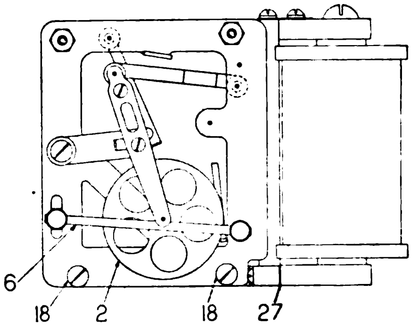


FIG. 2—TIME WHEEL DOWN THE TRACK.

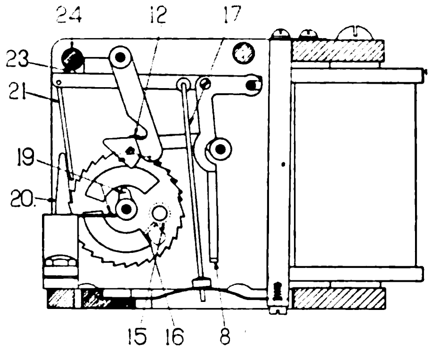


FIG. 3—ARMATURE NORMAL, PROPELLING LEVER UP, HOOK UNDER RETAINING LEVER LIP, RETAINING PAWL AT TOP OF TOOTH.

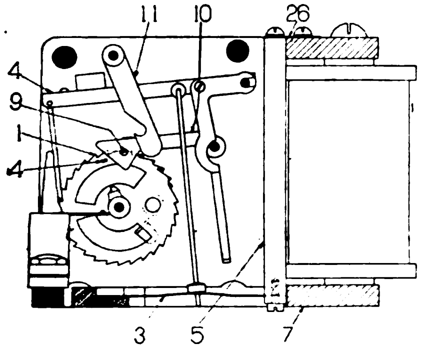


FIG. 4—ARMATURE PULLED UP, PROPELLING LEVER DOWN, HOOK OPERATED, RETAINING PAWL AT BOTTOM OF TOOTH.

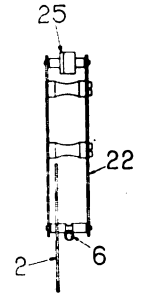


FIG. 5—END VIEW OF TIME WHEEL AND TRACK.

REFERENCES.

1—Combination Wheel.
2—Time Wheel.
3—Driving Spring.
4—Propelling Arm or Lever.
5—Armature.
6—Time Wheel Track.
7—Bottom Heel Iron.
8—Time Wheel Restoring Lever.
9—Retaining Pawl.
10—Retaining Pawl Lever.
11—Retaining Hook.
12—Retaining Lever Lip.
13—Retaining Hook Throw-Out Lever.
14—Combination Wheel Restoring Pin.
15—Counter-Weight.
16—Combination Wheel Stop.
17—Connecting Rod.
18—Frame Screws.
19—Contacts.
20—Propelling Pawl Stop.
21—Propelling Pawl.
22—Time Wheel Frame.
23—Propelling Pawl Stop Rivet.
24—Hardened Frame Post.
25—Time Wheel Connecting Lever.
26—Armature Hinge Spring.
27—Freezing Point Strip.

This careful balancing of forces naturally assures the Gill selector mechanism of a very long life, and it is a curious and instructive fact that after eight or ten years of constant service on a working telegraph wire the mechanism itself will, as a rule, show no signs of wear whatever, although the broad freezing-point strip (27, Fig. 2) may be actually pounded through by the blows of the armature.

So, when a Gill selector becomes inoperative it is always wise not to suspect it of being worn out. In such a case first examine the electrical characteristics of the circuit and be sure that the selector is receiving neither too much not too little current, and also assure yourself that the current impulses are arriving with due regularity. If your examination shows nothing amiss in these particulars, and if, as is usually the case, the selector is carefully sealed and is impervious to dust and moisture, it becomes highly probable that the bearings are sticking on account of the deterioration of the lubricating oil used thereon, and if this proves to be the case the selector must be cleaned and reoiled.

How often this will be necessary depends to a small extent on the climate and to a large extent on the quality of the oil originally used and on the nature of the service in which the selector is operating. Telegraph selectors will usually operate incessantly on a Morse wire for about three years before this attention is required, telephone selectors in train dispatching service from five to seven years. As the selector is especially designed to facilitate the cleaning operation, and as no mechanical readjustments are required the work can be undertaken by anyone with sufficient patience to observe the simple method of procedure to be described.

The following illustrations of the Gill selector mechanism are inserted and the various parts named in order that the reader may readily identify the parts referred to in the ensuing text. They may also be of interest to the reader who is not familiar with the fundamental operating principle of the Gill selector, as they clearly illustrate the fact that the closure of the selector contact depends upon the movement of the retaining pawl (9, Fig. 4) to the top or the bottom of the cut combination teeth in the combination wheel in a definite sequence, any departure from this sequence immediately restoring the combination wheel and its associated contact arm to the normal position and avoiding, therefore, the closure of the contact. This is accomplished by cutting grooves at an angle of about 45 degrees in the combination teeth at either the top or the bottom as desired, so that if the pawl is in an incorrect position it will immediately slide to one side and allow the combination wheel to restore itself.

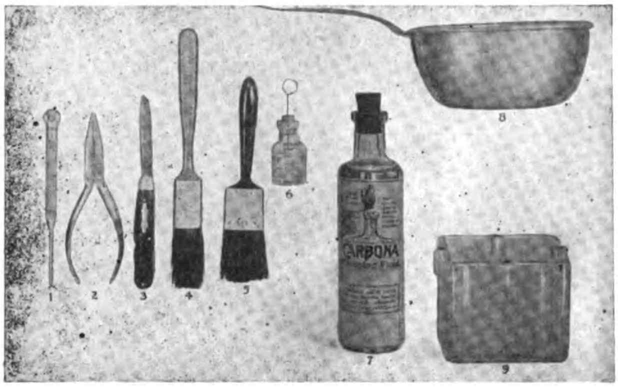


FIG. 6—ARTICLES NEEDED FOR CLEANING SELECTORS.

Before proceeding to clean and oil a Gill selector be sure that you have at hand the following articles:

1.—A screw driver with a ⅛ inch blade (Fig. 9.)

2.—A pair of "Long Nose" pliers (Fig. 8).

3.—A pocket knife.

4.—A medium stiff bristle brush one inch wide for scrubbing the mechanism in "Carbona." This brush must not be used for any other purpose (Fig. 12).

5.—Any convenient brush for applying hot paraffine (Fig. 18).

6.—A bottle of watch oil, the quality of which has been formally approved by the makers of the selector. A No. 22 gauge brass wire sharpened at one end like a screw driver blade should be driven through the cork as shown. (Fig. 17).

7.—A half pint or more of the cleaning fluid sold at drug stores under the trade name of "Carbona." Before using "Carbona"for the first time add four or five drops of the oil mentioned in paragraph 6. (Read directions under Fig. 13).

8.—A small quantity of paraffine and means for melting the same in a metal receptacle.

9.—A receptacle, preferably of glass, deep enough to contain a selector mechanism immersed in "Carbona." (See Fig. 11). In case an old style selector cover is used for this purpose be sure that it is perfectly free from paraffine and grease.

10.—A supply of clean cheese-cloth.

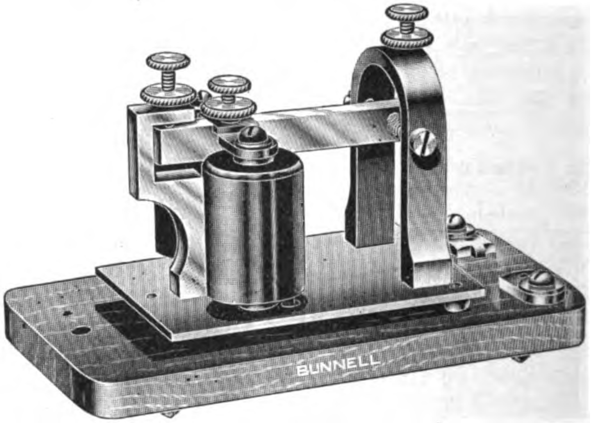
In addition to the foregoing, provide a clean flat surface on which to work. A smooth varnished board that can be kept quite free of the filings and dirt ordinarily present in a work shop, is the best surface for this purpose. It may also be convenient to install a telegraph key and flexible leads, in series with a battery of suitable voltage for testing the selector before finally replacing the glass cover.

(To be continued)

A Perfect Alternating Current Sounder.

J. H. Bunnell and Company, Inc., New York, announce the advent of a practical alternating current sounder, the principle of which is so simple that it is a wonder it was not discovered long ago. It is called the Ghegan alternating current sounder, the inventor being Mr. J. J. Ghegan, president of the Bunnell Company.

The instrument is the same size as the regular Bunnell local sounder which it resembles in general appearance, the same parts being used in its make-up, the only change being in the position of the magnet spools and the construction of the armature. It can be used on any 110-volt, 60-cycle alternating current circuit either in series with a lamp or through the secondary of a small inexpensive transformer. The transformer method is preferable, as with it the local wiring may be of the ordinary kind used in local battery work, and one transformer can furnish current for several sounders.



GHEGAN ALTERNATING CURRENT SOUNDER.

The instrument can also be operated on the 110-volt circuit without either lamp or transformer, when specially wound for such use.

Although the current required to operate the sounder in the ordinary way, through the front contact of a relay, is very small, it can be arranged to work through the back stop so that current would be used only when the sounder might be working.

This sounder will work on direct current without any change of adjustment so that in places where there is a liability of interruption to the alternating current lighting circuit, two dry cells could be switched in to bridge over any such interruptions.

The sounder is so well designed there is no perceptible heating even when left on closed circuit for hours, and the humming is so slight it is not noticeable.

Inasmuch as the alternating current is generally available, the Ghegan sounder would appear to be a satisfactory and economical solution of the local battery problem.

INDUSTRIAL.

The Multiplex in England.

In our issue of March 1 was printed an article about the report of the commission appointed by the British postmaster-general to examine the various systems of high-speed telegraphy. The committee reported in favor of the high-speed multiplex system designed and built by the Western Electric Company, Incorporated, and now used by the Western Union Telegraph Company in this country. This committee was composed of prominent postoffice officials and leading electrical engineers, who made a very painstaking investigation. As a practical experiment during their study a complete quadruplex duplex installation was tested on a circuit between London and Manchester. The committee reported that the multiplex handled at least two-thirds of the entire telegraphic traffic between London and Manchester over a single telegraph circuit, and that of the multiplex systems at present available the Western Electric Company's has given the best results.

Adding Machine for Managers.

The "Calculator" is a very valuable device for adding columns of figures of any length, and it is accurate in its results. Multiplying and subtracting can also be performed on it. It is very simple in construction and there is nothing to get out of order. It is strongly built, and is guaranteed for five years. This instrument eliminates the drudgery and the mental effort of adding, in fact all calculating work that gives brain fag. It adds quicker and more accurately than the best mathematician, and it takes only a few minutes to learn to use it. The results are read in plain figures on the face of the instrument. The Calculator weighs only three pounds, and can be easily carried to any part of the office. It does the same work as $300 adding machines, and it will save telegraph managers, particularly in the smaller offices, a great deal of time and labor.

This machine is for sale by Telegraph and Telephone Age, 253 Broadway, New York; price $10.00.

Morse Tape Recorder.

This instrument has been devised for the purpose of making records of what takes place on a wire. It shows how much time is lost; it proves the character of the work of the operators, and decides all questions of doubt or dispute which arise in connection with telegraph service. The pens are easily filled; they do not give any trouble in operation and make an accurate record of every dot and dash. This recorder is made by the Lamson Electrical Manufacturing Company, Chicago, Ill., of which Mr. J. A. Hulit, a well known old time telegrapher and inventor, is manager.

The Remington Typewriter Company (Incorporated) has opened its new central offices in the newly constructed Remington Building at 374 Broadway, New York. The building is occupied entirely by the executive, sales and service departments of the company, and patrons are invited to visit the new quarters.

Bunnell Word Counter.

The call for a compact and reliable word counter for attachment to typewriters has resulted in the development of the device illustrated herewith.

This instrument is strongly made, is very neat, takes up practically no space, and when it is in place on the typewriter it is hardly noticeable. It can be instantly attached or removed from the typewriter with the fingers, no tools being necessary. It records up to 99,999 words and can be set back instantly at any point of the work.

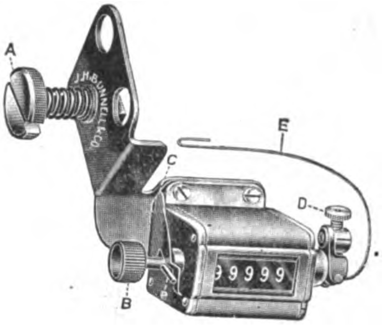


FIG. 1—THE COUNTER.

The first illustration shows the counter alone, and the second, the counter attached to a typewriter. Attachments for any make of typewriter can be had.

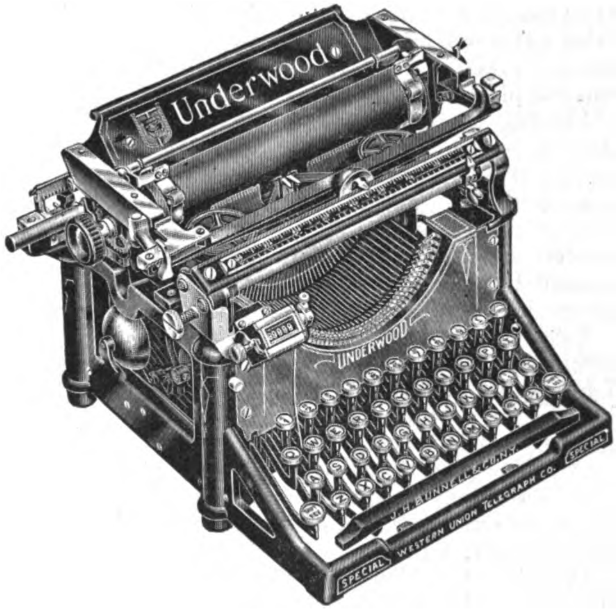


FIG. 2—COUNTER ATTACHED TO TYPEWRITER.

The price of this counter is $7.50, and the instrument can be purchased of Telegraph and Telephone Age, 253 Broadway, New York.

Mr. A. B. Cowan, general manager, Western Union Telegraph Company, Denver, Col., in remitting to cover his subscription for another year, writes: "Telegraph and Telephone Age is worth many times the subscription price."

Remember you do not have to fight, you do not have to struggle—you only have to know.

MR. JEFF W. HAYES' DEPARTMENT.

Address communications intended for the Chicago department to Jeff W. Hayes, Room 620, 111 West Jackson Boulevard, Chicago, Ill.

The Pleiades Club.

CHAPTER XII.

There was a large number of sailing craft on the Hesperian canal, on the planet Mars, all headed in the same direction and all evidently bound on the same mission. There were also some small steamers which kept up a fusilade of whistles extending "73" in Morse signals to the other craft. On board these vessels there was a lively lot of men, with a fair sprinkling of ladies, all beaming with smiles and good nature. This gay crowd was en route to attend the gathering of the railroad and commercial superintendents of telegraph which was booked to occur April 22.

The meeting was to take place in the Telegraphers' Tabernacle and everybody was asked to join, for as I mentioned before, there is no class distinction on the planet Mars. There was a long list of names and a long array of forms and faces very familiar to the denizens of earth.

The first one to alight from the steamer was Chas. W. Hammond, whose once serious face was now wreathed with smiles and good humor. He stopped to shake hands with his many friends who gathered around him and to crack some of his old jokes with them, for he is as dearly loved on the planet Mars as he was on mother earth.

"Hello, there, Charlie," exclaimed James W. Stacey, extending his hand to Hammond. "I have not seen you since you came down to Houston to visit," and the first superintendent of the Atchison, Topeka and Santa Fe telegraph system, smiled at his former colleague. Merry sallies passed between these gentlemen and the crowd proceeded up the little hillock to the Tabernacle.

"Well, if there is not my old friend and patron, Henry W. Wynkoop, all the way from Crestline, Ohio, and O. H. Booth from Mansfield, Ohio," and both gentlemen, arm in arm bowed their acknowledgments to a host of their former co-workers.

And here we have still another Ohio railroad superintendent as the form of Wm. Kline, Jr., came down the line accompanied by George A. Beach. Mr. Kline was for many years with the Lake Shore at Toledo, Ohio, and has graduated more first class operators from his road than any other superintendent in the country, all of whom esteemed and loved their chief.

George A. Beach, also from Toledo where he spent so many years with the Wabash Railroad accompanied by Joseph Keenan was surrounded by a number of old friends and colleagues.

Frank Vandenburg from the Southern Pacific, San Francisco, and Col. John J. Dickey, of the Union Pacific, were recounting the happy days spent on the Pacific Coast.

"Yes, I remember how you favored big batteries, big relays and big operators," ejaculated Col. Dickey, addressing Vandenburg.

"Yes, and I recollect how you used to like to attend the yearly gatherings of the old-timers," returned Vandenburg, with a broad smile.

"Right you are, and you can see that I am doing business at the old stand," came from Col. Dickey as he halted to shake hands with W. B. Hibbard and J. C. Sheldon, who were passing along in an automobile.

It was a great pleasure to witness the meeting between Harry C. Hope and U. J. Fry, the former of St. Paul and the latter of the Chicago, Milwaukee and St. Paul road at Milwaukee. Mr. Hope was never a speechmaker but he is certainly a most delightful and entertaining single-handed talker.

Mr. Fry was in his usual kind and gentle mood and made inquiries for the many gone before whom he was anxious to meet.

E. J. Little, from St. Paul, a recent arrival, accompanied Messrs. Hope and Fry around the Tabernacle, shaking hands with old friends. Mr. Little brought the latest telegraph news from the earth, which was listened to attentively.

Many old commercial superintendents whose names are historical with the telegraph now came along in automobiles to take part in the meeting.

Of course there was the revered S. F. B. Morse, father of the telegraph, who received a great ovation. There was C. H. Haskins, so well known to the old Chicagoan, Col. J. J. S. Wilson, so long with the Western Union at Chicago; I. McMichael and James Swan of Minneapolis, C. O. Rowe of Pittsburg, E. P. Wright of Cleveland, L. C. Baker of St. Louis, Frank G. Beach of the Atlantic and Pacific, Cleveland; David Flanery of New Orleans, George H. Usher of Atlanta, Ga.; C. A. Darlton of Washington, Asa R. Swift of Chicago, S. A. D. Forristall of Boston, Sam. S. Bogart, Jesse H. Bunnell and E. G. Cochrane of New York, and George M. Dugan of Tip Top, Ky.

The smiling face of James H. Guild, who was superintendent for the Oregon Railway and Navigation Company's telegraphs for so long during the pioneer days of Oregon and Washington, was much in evidence. He was surrounded by a happy throng of his old boys, who were relating all the latest news which came up from the earth. Mr. Guild had always been a great exponent of total abstinence and he expressed much pleasure to know that both Oregon and Washington had gone dry. Many of the other superintendents readily gave their "ok" to Mr. Guild's views.

Frank Jaynes, James Gamble, George Ladd, R. R. Haines, Peter Lovell and others of the Pacific Coast were busily engaged in making the day pleasant for all those in attendance and in this they were cheerfully assisted by their brothers from the East.

A committee composed of Henry C. Hope, U. J. Fry and Wm. Kline, Jr., was appointed to draft a telegram of congratulations to be extended the president of the Association of Railway Telegraph Superintendents, soon to convene in Washington, D. C.

Copies of TELEGRAPH AND TELEPHONE AGE containing the news of the passing of Charles A. Tinker were read with much interest and a committee was appointed to watch the Cannon Ball Express train to welcome that gentleman's arrival on the planet Mars.

The meeting is still in session and it will continue to be for a day or two, after which there will be the usual excursion over the little planet, all to be wound up by a magnificent banquet.

We hope to receive more particulars of the doings of the meeting for future publication.

Moose Jaw, Sask., Canadian Pacific Railway Notes.

It has always been a wonder to me where the name of the city of Moose Jaw was derived. Sampson slew his enemies, the Philistines, with the jawbone of an ass, but it remained for Sampson Trask, a rancher driving a Red River cart, to name the city of Moose Jaw and have that homely appellation go thundering down the ages of time. It occurred this way: The Red River cart is made entirely of wood, including the axle, hub and tire. It emits a scream which is loud and piercing, and a dozen of these carts will put to shame a flock of coyotes.

Sampson Trask, in coming through the present city of Moose Jaw, had the misfortune of breaking one of the wheels of his cart and could proceed no further. He looked around to find some instrument to patch up the broken wheel and presently discovered the jaw of a moose partly covered with dust. Deftly did he utilize this relic to put his cart together, and so glad was he to be able to continue his journey uninterruptedly that he named the place Moose Jaw; that is how that cognomen is now on the map.

It is a very pretty place, however, with good, strong, healthy air, and abundance of crops and some of the nicest people in the world. Everybody who lives in Moose Jaw for a little while does not care to leave and is willing to live and die in the delectable country.

It was certainly a great pleasure to again meet our old friend of years ago, Samuel J. Small, and we had a most pleasant and entertaining visit from that gentleman, whom we had not seen for a quarter of a century.

Rufus Russell is chief operator for the Canadian Pacific Railway and has labored in this vineyard for the past five years. He is one of those good, wholesome men that we occasionally meet during a lifetime. He is very popular with his men, and it must be said to their credit that his popularity is never imposed upon.

W. Benjamin Way is the night chief and is an old timer. His ambition is not so much to rise in his profession as it is to do his work well and live a life of harmony and tranquility.

Roy D. Collier is known throughout the western country and is a gilt-edged operator and a clean-cut fine young gentleman. He is well known on the Pacific coast and his reputation as given is fully established.

Thomas H. Lough, of the printer department, is a student in his line and is thoroughly conversant with his duties. Mr. Lough is a very pleasant young man to meet.

Mrs. L. M. Dawson is a first class operator and is the peer of any of the masculine gender as regards telegraphic ability. We were very much pleased to make her acquaintance.

And now we come to a name which is a household word in every telegraphic home in northwest Canada, W. H. Middlemiss. This gentleman is an old-timer from way back and retains both his grip and popularity with his colleagues.

G. Brownrigg, recently transferred to Moose Jaw from Swift Current is making progress and friends along the way.

R. B. McCammon is day traffic chief. Bob comes from one of the best families in Moose Jaw and is noted for his gentleness of spirit and unselfishness of heart.

H. L. Horn is a dispatcher for the Canadian Pacific Railway, an old-timer and a very pleasant gentleman.

G. D. Fackler, an old-time press operator, well known to the fraternity of 1900 and of late on the Pacific Coast, particularly at Seattle, came to Moose Jaw a year and a half ago and was appointed manager of the Moose Jaw Grain Exchange, and has brought that institution up to its present state of efficiency. He is strictly a gilt-edged operator and possesses rare business qualifications.

Daniel Coons is superintendent for this district, having risen to that position through hard work and careful attention to business. Mr. Coons has for his chief clerk, Mr. Gibson, who is the right man in the right place.

The manager, S. M. Thurston, is a very businesslike, energetic and courteous gentleman who took pains to make our stay in Moose Jaw pleasant.

R. Gemmel is a first class operator and is doing excellent work in his own way in uplifting the craft and improving their condition.

We are glad to carry with us a kind remembrance of all the good people we met during our sojourn in the city with the homely name.

Appended is the roster of the Moose Jaw office: D. Coons, superintendent; S. J. Baker, inspector; D. W. Gibson, chief clerk; S. M. Thurston, manager; R. Russell, chief operator; W. B. Way, night chief operator; T. R. Miller, late night chief; G. D. Fackler, manager, Grain Exchange. Operators: C. Stansfield, R. Gemmell, B. U. Stiff, J. H. Waddell, C. McMahon, P. Henley, S. J. Small, Roy D. Collier, W. Henley, A. McLaren, W. H. Middlemiss, Mrs. L. M. Dawson, Geo. Brownrigg, T. F. Lough, printer supervisor; F. Neal, Morkrum operator

Chicago Western Union.

S. R. Crowder, traffic layout engineer, New York, has spent ten days in Chicago in connection with contemplated new installations.

H. E. Roberts of Vice-President J. C. Willever's office, New York, was also a recent visitor.

Division Traffic Superintendent J. P. Edwards recently spent two days with friends at Atlanta, Ga.

A Busy Bee Hive.

Probably no other room space in the city of Chicago is the scene of as much activity as are the quarters of the Western Union Telegraph Company in that city. Every available inch of space is occupied and put to the best use possible.

When the company moved into the present location it was thought that the quarters were large enough for all time, and if anyone had the temerity to suggest that a day would come when more space would be necessary he would have been jeered at.

The old philosophical darkey used to say: "You can nebber tell how far a frog is gwine to jump till you see him light," and you can never figure upon the development of the telegraph business so long as it is in the hands of progressive people.

Several thousand persons come and go, to and from this great building. Some tarry eight or nine hours and more remain as visitors just that number of minutes, but the corridors and elevators are constantly crowded.

The removal of the plant department to the Webster Building it was thought would relieve the pressure, but it was only temporarily, and today the building is crowded to its fullest extent.

Something will have to be done to give the occupants of this building more room and it might eventuate in moving to more desirable quarters, which change would be appreciated by everybody, including the public.

Martin J. Tully, an old timer, is chief of the delivery department. Mr. Tully's head contains an encyclopedia of the city.

The following connected with the plant department of the Western Union are now located in the Webster Building, Chicago: L. R. Robinson, C. C. Bowers, D. McReynolds, W. W. Watt, E. Parsons, W. S. Wood, R. Taylor.

Chicago Postal.

Mrs. W. A. Lovelace is in charge of the first New York bonus wire, which is the fastest circuit in the office. Her work is strictly gilt-edged.

William T. Plummer, the pioneer typewriter man and an old operator, still conducts his business at 901 Postal Telegraph building, Chicago, where he has earned for himself a reputation for fair dealing.

Miscellaneous.

John L. Cassidy, whose cartoons have been admired by the craft for four decades, is with the North American Telegraph Company at Minneapolis.

William Burroughs, so well known to the Chicagoan of years ago as the Beau Brummell of the profession is still in the business here with a broker firm.

Miss Emma Hurley, erstwhile time keeper for the Western Union at Minneapolis, is now filling an important position in the printer department in the same city.

Carl B. Knapp, erstwhile star operator, at one time connected with the copper industry, is now manager for Clements, Curtis and Company of Chicago.

Walter Murphy, who has been conducting a brokerage business for several years past, has closed his office and returned to Chicago where he is employed by the brokerage firm of Thompson and McKinnon.

Daniel McKinnon is manager of the Logan and Bryan telegraph office in Minneapolis. His brother, John is with the Canadian Pacific Telegraph in Vancouver, and another brother, Roderick, is a partner in the Chicago brokerage firm of Thompson & McKinnon.

E. W. Mayfield, superintendent of the Cleveland Telegraph Company is conducting a large and profitable brokerage business in Chicago. Mr. Mayfield is well known among the fraternity in St. Louis, Kansas City, Omaha and Chicago.

Mr. A. W. Orton, a prominent military telegrapher during the Civil War and for many years in another line of business at Rome, N. Y., writes:- "Your renewing my subscription each year is agreeable to my taste and habits. Am enclosing the substance for renewal. While my lines are divergent from the key and pen of former years, my interest has never lagged from interest in the Knights of the Morse battalions."

LETTERS FROM OUR AGENTS.

New York Postal.

During the past two months this company has equipped six new offices in the Metropolitan district of New York. Five of these offices have been moved from old locations and one is a newly established office. The offices transferred are, from 853 Broadway to No. 23 Union Square; from Twenty-eighth Street and Fourth Avenue to No. 75 Madison Avenue; from the north side of Forty-second Street, at Fifth Avenue, to the new Astor Trust Building at Forty-second Street and Fifth Avenue; from Fifty-fourth Street and Third Avenue, to Fifty-first Street and Lexington Avenue; from Thirty-eighth Street and Broadway to No. 4 West Thirty-seventh Street near Fifth Avenue. The new office opened is in the new Berkeley Building, No. 20 West Forty-fifth Street, just off Fifth Avenue. All of these offices contain the most modern equipment, a special feature of which is the call circuit instruments consisting of the new miniature district relays and annunciator bells of efficient and handsome design. Also a new, convenient and attractive type of Morse switchboard. Four of these offices are furnished with mahogany fixtures and two with oak. All of the planning and supervision in connection with installing these new offices was done by Division Engineer J. P. O'Donohue, and Assistant Engineer D. McNicol.

Joseph M. Sullivan, for many years an operator employed in the main office, died April 15 of heart disease. He is survived by his wife and three children. Mr. Sullivan was well known to the telegraphic fraternity throughout the United States and Canada.

New York Western Union.

S. B. Haig, division traffic superintendent, is again at his desk after an absence from his office for some time on official business.

J. E. Palmer, father of Chief Operator George E. Palmer, of this office, who has spent his entire life in the telegraph service, has been added to the force in the repeater department. Mr. Palmer, who comes from Pittsburgh, is an expert electrician, and his addition to the staff is both timely and valuable.

Among the deaths recorded since our previous issue are the wives of F. J. Sheridan on April 16 and Ham Fitchett on April 22, and Operator J. W. Miller, who passed away on April 17.

A young telegraph messenger picked up a suit case a few days ago containing $10,000 that had dropped from the automobile of the representative of an express company. He took it to the express office and waited for the arrival of the man whose name was on the case, and for his honesty was given a better position with the express company.

Miss Helen R. Driscoll, operator, city lines, was married on April 15 to George Walsh of the multiplex department.

Washington, D. C., Western Union.

The wife of Harry McKeldin, chief operator of this office, was struck by an automobile on April 21 and died a few minutes after reaching the hospital. Mrs. McKeldin was well known on account of her frequent attendance at the reunions of the Old-Time Telegraphers.

Detroit, Mich., Western Union.

J. M. Fair, chief clerk in the office of the manager in this city, has been retired on pension. Mr. Fair was manager at Saginaw, Mich., 1897 to 1903, and manager at Grand Rapids, Mich., 1903 to 1911, when he resigned, and in 1912 accepted the position of chief clerk in the manager's office here. Mr. Fair entered the service of the Montreal Telegraph Company in 1872 at Leamington, Ont., and was in the service of the Western Union from 1880, working in many of the larger offices between New York and San Francisco.

Philadelphia Postal.

Philadelphia sent a strong delegation to the recent dinner of the Magnetic Club at New York. C. C. Adams, president of the club was for many years located in this city and the Quaker City is proud to pay its homage to the club and its president.

On account of the recent explosion near Chester, Pa., J. H. Liberman and H. L. Eastman, two of Philadelphia's expert operators were assigned to aid Manager Conley in handling the flood of telegraph business.

"Cupid" is once more on the job in the main office. J. J. Hardy chief clerk to the superintendent, and Miss Anna M. Ryan of the bookkeeping department were married on April 18. The newly wedded couple spent their honeymoon at Atlantic City and visited points of interest in New Jersey. Mr. and Mrs. Hardy have the best wishes of the entire staff for their future happiness.

The Pottsville office is now located in its new quarters in the *Chronicle* building. The office has been fitted up with the latest fixtures and the furniture is all of oak being in harmony with the other wood-work finishings. It is conceded to be one of the finest offices in that locality. Superintendent C. E. Bagley is proud of the new location and the office force. The wiring was under the supervision of Philadelphia office Electrician Alford G. Carpenter, and D. Rhein and H. Wise, assistants. The interior work and the furnishings were supervised by Frank Burke, Philadephia master carpenter. George Lord is the manager and H. Bierman, operator.

Robert S. Willis, operator for E. B. Smith and Company, this city, bankers and brokers, died on April 9.

The father of Russell Keys, clerk to District Foreman Gorsuch, died on April 23. Mr. Keys a few months ago lost his mother.

Dot and Dash Club.

At the recent annual meeting of the Dot and Dash Club in Philadelphia, of which club the late S. S. Garwood was president, Mr. C. E. Bagley, first vice-president, presided. It was one of the best attended and enthusiastic meetings of the club since its inception.

Mr. Andrew S. Weir made a report for the governing board. Reports were also read by the treasurer, Mr. James Wilson; the secretary, Mr. W. W. Donnelly, and the auditing committee.

During the previous twelve months the following members of the club passed away: President S. S. Garwood, T. Walter Baird, O. J. DeRousse, J. A. Sisk and C. W. Zecher. The following members of the club spoke in memory of the departed: Messrs. E. W. Miller, A. J. Weir, R. J. Murray, A. G. Strickland, J. E. Williams, J. M. Jones, Jos. McIver, R. C. Mecredy, F. R. Webb and E. C. Boileau.

The election resulted as follows: President, C. E. Bagley; first vice-president, J. W. Reed; second vice-president, A. S. Weir; third vice-president, J. C. Johnson; fourth vice-president, F. W. Griffin; secretary, R. A. Black; treasurer, James H. Wilson; governing board, E. C. Boileau, J. A. Chapman, F. E. Maize, E. W. Miller, I. D. Maize, J. M. Jones, A. G. Strickland, F. R. Webb, John Wintrup, H. M. Brown and A. G. Wallace.

The meeting adjourned after partaking of an enjoyable repast.

At the organization meeting for the year 1917, President C. E. Bagley was in the chair and Mr. A. G. Strickland was unanimously elected chairman of the board.

The meeting was fully attended and glowing reports and prospects were heard from all sides. The present year promises to be a very prosperous one for the Dot and Dash Club.

Boston Western Union.

An instructive talk on the use and proper adjustment of the single line relay was given by Late Night Chief J. J. Mullen, at a recent meeting of the Western Union Electrical Society. Refreshments and dancing followed the business meeting.

Repeater Chief M. C. Harrington and Repeater Attendant R. L. Stevens have recently returned from vacations.

A. E. Ridley has been appointed Multiplex attendant.

Multiplex machines have replaced Barclays on the Buffalo and Philadelphia locals.

A baby girl has reached the home of Supervisor H. E. Zinzer.

Wm. Sheridan of the *Journal* office accompanied the Red Sox Special to the Hot Springs training camp.

Messrs. Angel of the North Sydney and Bailey of the Bay Roberts cable stations were recent office visitors.

Denver, Col., Western Union.

Morse Department—Late arrivals are C. H. Beam and L. P. Wynn. C. B. Kruger has been transferred from Billings, Mont. R. L. Berger has been absent for some time on account of the death of his wife. E. V. Rogers transferred from Oklahoma City. Bernard Cummings returned from service with the National Guard on the Mexican border. H. L. Jones transferred from Billings, Mont. C. H. Doyle transferred from Kansas City as wire chief, relieving E. E. Stanfield, who has gone to Helena as chief operator. F. B. Rose transferred from Cheyenne. W. J. Miles is absent on furlough. L. D. Hastings transferred to Billings, Mont., R. H. Tobin, office messenger, has joined the navy. Mrs. J. F. Gardner, visiting nurse, transferred to San Francisco. S. P. Apodaca transferred to Albuquerque, N. M., W. W. Giffin, student traffic and regulating department transferred to Billings, Mont., M. D. Bancroft, night monitor, transferred to Dallas, Tex., and relieved by A. J. Loeb.

Multiplex Department—J. H. Learnard and C. A. Bradbury have just returned from the Mexican border service with the National Guard. Wm. Adams has joined the navy and left a short time ago for the training school. Harry H. Fisher transferred from San Francisco as multiplex attendant, Miss Dean Wood has returned from furlough.

Telephone Department—Miss Carrie Smith, instructor, goes to Wichita for a few months as instructor, being relieved by Miss Isabella Ferguson, who in turn is relieved by H. L. Cox of the night force, Emmitt Dunn, late night supervisor, relieving Mr. Cox as night supervisor, Thomas Martin will be the late night supervisor.

The Telegraph and Telephone Life Insurance Association has levied assessments 619 and 620 to meet the claims arising from the deaths of N. Young at Washington, D. C.; W. Henry, Council Bluffs, Ia.; S. H. Ingersoll, Estill Springs, Tenn.; C. Rogers, Philadelphia, Pa.; J. Costelloe, Brooklyn, N. Y.; J. P. McCabe, Cincinnati, O.; A. McNeely, New Castle, Pa.; S. D. Sprigg, Baltimore, Md.; J. C. Wilson, Boston, Mass.; C. A. Tinker, Winnipeg, Man., W. J. Wallis, Los Angeles, Cal.; W. D. Schram, Yonkers, N. Y.

Mr. James B. Austin, for many years prominent in telegraph and press circles at Washington, D. C., now living in retirement at South Bend, Ind., writes: "Although I am out of the telegraphic ranks now, I like to keep in touch with affairs. One never entirely gets away from it, you know, so I am always glad when the Age arrives."

An order reached our office recently reading: "Send me quickly as possible one Conklin on the Phonograph." The popularity of Cohen on the Telephone will now disappear in favor of the first mentioned record.

Mr. Samuel A. Duncan, formerly assistant general superintendent of the Postal Telegraph-Cable Company, Atlanta, Ga., for several years past in other business in that city writes: "You are right in renewing this subscription from time to time as I am still keeping up through your paper with my telegraph friends."

Mr. J. Hoffman, manager, Postal Telegraph-Cable Company, Orange, N. J., in renewing his subscription, writes: "I am very much interested in the series of talks on Efficiency Engineering in the Telegraph Service. In my opinion these articles are worth several times the subscription price of the Age."

Mr. T. B. Kingsbury, manager, Western Union Telegraph Company, Norfolk, Va., in remitting to cover his subscription, writes: "The educational articles printed in your publication are very beneficial."

Telegraph and Radio Operators, Electricians and Linemen, wanted for Signal Corps, U. S. Army. Pay ranges, according to rank and service, home or foreign, from $15 to $90 a month, and in addition rations, quarters, clothing and medical attendance are furnished. Signal Corps offers unusual opportunities for foreign service and rapid promotion to young men of character, intelligence and ability, who have had electrical training, particularly as telegraph or radio operators. For detailed information write to Chief Signal Officer, U. S. Army, Washington, D. C.

32d YEAR

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Telegraph and Telephone Age

No. 10. NEW YORK, MAY 16, 1917. Thirty-fifth Year.

Telegraph and Telephone Age

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BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, MAY 16, 1917.

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Call for Operators for Government Service.

We do not read or hear much about war preparations in this country these days since the first excitement over the declaration of war has subsided, but the government is not napping by any means. Preparations are going forward with great vigor in Washington, while the people are inclined to forget that we are in an actual state of war.

Among the most important services required by the government to conduct warlike operations is signaling, and a call has been made by the War Department for hundreds of operators. Young women as well as young men are urged to enter the telegraph service and the training of this army of telegraphers will be a great undertaking. These operators are to enable the government to handle its war telegraph business without taking any more operators from the railroad and commercial telegraph forces, many members of which have joined the colors. The Western Union Telegraph Company alone will undertake the task of training 2,500 operators for the government service. There are more than 30,000 amateur wireless operators in the United States and it is hoped that these young men will come forward and help their country in the present crisis.

Young women are particularly desired for commercial work, according to the government appeal, and this will give an excellent opportunity for this class of help to aid the cause too. Women are doing active and important work in all countries at war and America should lead in this great movement.

Telegraph operators in the Army and in the Navy occupy preferred positions, both as to rank and pay, and this will be a great incentive to ambitious young men to join either branch.

The present time is full of opportunity for telegraphers and they should not hesitate to do what they can to further the cause to which the United States is now committed.

Reinforced Concrete Poles.

Centrifugal force applied to a mass of concrete within a form in the manufacture of telegraph and telephone poles is a distinct advance in the art of pole making. By this method the density of the mass is the highest possible with a consequent maximum strength of structure. The pole is reinforced and in all points it is said to be superior to poles of other materials.

A concrete pole made in this manner should last an indefinite length of time, and the expenses of maintenance should be practically nothing, and while the first cost is somewhat higher than a treated wooden pole, its longer life will more than counterbalance the greater original cost. Such a pole is much superior to fabricated and other steel poles which require painting every year to avoid failure due to deterioration, rust, etc. An interesting account of the method of manufacture of concrete poles of this type is described elsewhere in this issue.

Tragic Death of Two Champion Telegraphers.

The untimely death of George W. Conkling, champion telegrapher, recalls to mind the fate of another champion twenty-eight years ago—J. B. Roloson—who was killed in Brooklyn while riding a bicycle. Both men were tall and well-built. They were brilliant telegraphers and won laurels in telegraph tournaments. Conkling's death was the result of the upsetting of an automobile in which he was riding, and that of Roloson by being run down by a butcher wagon while riding a bicycle.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on May 11:

American Tel. and Tel. Co.	119⅞
Mackay Companies	83-84
Mackay Companies, pfd.	64-65¼
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2½
Western Union	91

Telegraph and Telephone Patents.

ISSUED APRIL 10.

1,221,814. Electric Telegraph System. To C. Adams-Randall, Boston, Mass.

1,221,865 and 1,221,866. Telephone Exchange System. To L. H. Johnson, New York.

1,221,870. Telegraphy. To I. Kitsee, Philadelphia, Pa.

1,221,879. Semi-Automatic Telephone System. To A. E. Lundell, New York.

1,221,917. Telephone Exchange System. To A. B. Sperry, New York.

1,222,043. Telephone System. To F. M. Slough, Rochester, N. Y.

1,222,077. Fraud-Detecting Telephone Toll System. To V. D. Cousins, Boston, Mass.

1,222,151. Pay Telephone Electric Recorder. To A. F. Sipperley, Denver, Col.

1,222,303. Quadruplex Telegraphy. To I. Kitsee, Philadelphia, Pa.

1,222,323. Telephone Exchange System. To A. Raynsford, New York.

1,222,342. Telephone Exchange System. To R. S. Wilbur, New York.

1,222,343. Extension Telephone Signal. To P. J. Wires, Indianapolis, Ind.

1,222,348. Electric Telephone Talking Machine. E. H. Amet, Redondo Beach, Cal.

1,222,567. Transmitting Apparatus for Wireless Telegraph Stations. To F. G. Simpson, Seattle, Wash.

ISSUED APRIL 17.

1,222,771. Telegraphic Receiving Organism. To I. Kitsee, Philadelphia.

1,222,790. Telephone Transmitter. To J. G. Nolen and R. L. McElroy, New York.

1,222,879. Telephone System. To A. E. Lundell, New York.

1,222,986. Circuit Controlling Telephone Receiver Support. To W. Pick, New York.

1,223,020. Telephone System. To W. Aitken, London, England.

1,223,349. Telephone System. To F. W. Dunbar, Chicago, Ill.

ISSUED APRIL 24.

1,223,369. Telephone System. To E. E. Clement, Cleveland, Ohio.

1,223,376. Wireless Receiving System. To L. Espenschied, New York.

1,223,382. Locking Mechanism for Impulse-Transmitters. To C. L. Goodrum, New York.

1,223,463. Printing Telegraph. To J. E. Wright, New York.

1,223,496. Electrostatic Telephone System. To I. Langmuir, New York.

1,223,506. Common Battery Automatic Telephone System. To T. G. Martin, Chicago.

PERSONAL.

Mr. Baker's Birthday.

Notwithstanding the fact that Mr. W. H. Baker, one of the most prominent telegraph officials during the past twenty-five years, has retired from active service, his friends remembered him on his birthday, which occurred recently, by sending him numerous congratulations and best wishes for his future. Mr. Baker may be out of business touch with his friends but he is certainly not forgotten, as is often the case with retired officials. So numerous were the well wishes sent him that he found it necessary to issue the following circular letter which was mailed to each of those who remembered him:

"To my friends and associates for many years:

"Your birthday greetings and kind wishes caused me much pleasure.

"Such evidence of kindly interest and good feeling after so many years of close association should be and is indeed highly prized.

"I beg to assure you all that I heartily reciprocate all your kindly expressions of good will.

"Wishing I could take you each by the hand and look into your eyes and tell you how happy you have made me and how highly I regard your friendship, I am, with all good wishes to you,

"Sincerely yours,
"William H. Baker."

Mr. Thomas F. Clark, formerly vice-president of the Western Union Telegraph Company, New York, who retired from active service ten years ago, is in Japan. He will visit China before returning home.

Mr. Nikola Tesla, the well-known scientist and electrical engineer, will be presented with the Edison Medal at a meeting of the American Institute of Electrical Engineers in New York, May 18. This medal was awarded to Mr. Tesla December 13, 1916 "for meritorious achievement in his early original work in polyphase and high frequency electric current."

Mr. Walter P. Phillips, who is making a tour of the South, was in Mobile, Ala., recently. He is being honored by newspaper and telegraph people wherever he visits. While in Mobile he gave a telegraph and wireless-record demonstration.

Mr. J. H. Borchers has been appointed superintendent of telegraph and telephone of The Texas Company, with headquarters at Houston, Tex., vice J. R. Mayer, deceased.

Large Task for Telegraph Companies.—Hon. W. G. McAdoo, secretary of the treasury, Washington, D. C., on May 3 telegraphed to the entire list of 27,513 national and state banks and trust companies in the United States authorizing them to receive subscriptions for the $2,000,000,000 bond offering, enlisting their co-operation, and requesting them to telegraph a rough estimate of the amount of bonds each would take for itself and patrons.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

MR. EDWARD REYNOLDS, vice-president and general manager, who recently returned from a business trip to the Pacific Coast, found affairs in all the offices he visited in a very satisfactory condition. "Business is good at all points," he said, "and I have never found greater harmony and good feeling among the employes than on this trip."

VICE-PRESIDENT C. C. ADAMS has been elected a director of the Nassau County Hospital Association. The hospital is located at Mineola, Long Island, and is one of the largest in the state, outside of New York City.

Mr. W. I. CAPEN, vice-president, is on a trip of inspection through the middle west. He will be absent ten days.

GENERAL SUPERINTENDENT E. W. COLLINS, of Chicago, and Superintendent John F. Looney, of Indianapolis, visited Louisville, Ky., recently, Mr. Collins going on to Frankfort and Lexington, to visit these offices that were formerly in his territory when he was a superintendent at Cleveland, Ohio.

MR. A. B. RICHARDS, the newly appointed general superintendent of the Pacific Division, San Francisco, Cal., was tendered a complimentary dinner at the Muelbach Hotel, Kansas City, Mo., by the local staff, on the eve of his departure for his new post.

MR. ARTHUR H. BECKMAN, recently appointed manager of the Salt Lake City, Utah, office of this company, was born in Chicago, October 11, 1885. He began his telegraph career in August, 1899. He has been with this company since 1906 occupying many important positions.

MR. R. A. HARDEN, JR., cashier at Charleston, S. C., has been transferred to Richmond, Va., to a like position. He is succeeded by Emmett Johnson, former manager of the Western Union office at Charleston.

MR. MERRILL G. MORRIS, son of Mr. William Morris, manager of the Lowell, Mass., office of this company, has passed the examination for the Plattsburg, N. Y., reserve officers' camp.

MANAGERS APPOINTED. — Miss Mildred Murray, Council Bluffs, Ia.; George D. Baughman, Orrville, Ohio; T. J. Hall, Washington Court House, Ohio; J. R. Shannon, Goldsboro, N. C.; C. L. Prefontaine, Kokomo, Ind.; Harris Gaines, De Land, Fla.; E. A. DeSautelle, Beloit, Wis.; H. L. Knowles, Adrian, Mich.; C. H. Preston, Eugene, Ore.; Bertha Cohoon, Owosso, Mich.; H. L. Hancock, Henderson, N. C.

Alpheus B. Richards, General Superintendent, Pacific Division.

The announcement that Alpheus B. Richards, district superintendent of the Postal Telegraph-Cable Company at Kansas City, Mo., is to be general superintendent of the Pacific Division, in effect May 15, with headquarters at San Francisco, Cal., succeeding J. G. Blake, transferred to Chicago as general agent, will be regarded with approval. Wherever Mr. Richards is known, his abilities, his extensive and practical acquaintance with telegraphic needs, as well as his probity of character are freely recognized.

Under Mr. Richards' superintendency, the fifth district, Western Division, has been brought up to a high state of efficiency, demonstrating the executive ability of the man. He is a student and stands high as an electrician, in which capacity he has acted as a successful instructor to many of those about him, and others occupying positions of prominence in various sections of the country. He is equally at home in the producing end of the business. We quote from his article in the January, 1911, *Postal Telegraph:*

A. B. RICHARDS.

"I cannot promise you that the study of the *Postal Telegraph,* or a close acquaintance with rules will bring you promotion or increase in salary. Yet, I am sure that these studies rightly pursued will do much in making you more useful to yourself and to the corporation you represent. And is there anything more worthy of your time and attention than the bettering of yourself and your condition?"

Mr. Richards holds that the employe is efficient who studies his company's literature and endeavors to familiarize himself with its policies.

Birthday Anniversary of E. E. Heasley, Chief Operator, Pittsburgh, Pa.

Chief Operator E. E. Heasley of the Pittsburgh, Pa., office, was presented with a handsome traveling bag and a gold watch-chain with a gold knife attached on April 23, the anniversary of his birthday, at his home in the East End, Pittsburgh. Mr. W. F. Craig of the *Press* read an interesting paper on the history of the Postal Telegraph-Cable Company and Superintendent H. Scrivens made a brief speech and presented the bag and watch-chain to Mr. Heasley.

Mr. Heasley was born at Irwin, Pa., April 22, 1864. He learned telegraphy at that place and was made manager of the Western Union office when sixteen years of age. After four years' service he resigned to go West and worked in nearly all of the principal western cities, returning to Pittsburgh in 1888 for the Postal Telegraph-Cable Company. In 1895 he accepted a position as wire chief for the American Telephone and Telegraph Company at Pittsburgh. He left this service in 1907 to return to the Postal Company and filled the positions of repeater chief, wire chief and assistant night chief operator. He was appointed chief operator in August, 1915.

E. E. HEASLEY.

Mr. Heasley is very progressive and resourceful, has a pleasing address, and is well liked by his associates.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Messrs. J. C. Willever, vice-president in charge of commercial department, and T. W. Carroll, general manager, Eastern Division, have returned from a business trip through the southern part of the division. Mr. Willever was accompanied by Mrs. Willever.

An Emergency Call for operators has been issued by the War Department, and the Western Union Telegraph Company has placed its facilities at the disposal of the government to teach 2,500 operators. The call is for young women as well as for young men. Several thousand young men and women are needed for telegraph service either in the Signal Corps of the Army or to replace those in commercial work who are leaving positions to join the colors.

Mr. J. J. Welch, assistant traffic manager of cables, New York, was in Des Moines, Iowa, last week, on account of the illness of his sister.

Mr. W. McD. Milne, division auditor, Chicago, was in New York recently on business.

Mr. R. O. Jones, of Mr. W. N. Fashbaugh's office, has gone to Hearts Content, N. F., in the interests of the multiplex system.

Captain James Adams, of Halifax, N. S., commander of the Western Union Telegraph Company's cable ship "Minia," was in New York recently on business.

Mr. C. E. Thatcher, for the last six years manager of the Western Union office in San Francisco, Cal., has resigned to accept the position of assistant to the general manager of the East Bay Water Company, Oakland, Cal. Mr. Thatcher was the guest of honor at a luncheon at the Commercial Club on April 7, tendered by the Western Union office force.

Corpus Christi Rotary Club.

March 29 was "Western Union Luncheon Day" for the Corpus Christi, Tex., Rotary Club and many messages of greetings were received from Rotarians throughout the United States. Mr. C. J. Heath, manager of the Corpus Christi office, spoke a good word for that city. He says in Corpus Christi one "can fish, shoot, bathe or fight every day in the year. There is only one Corpus Christi in the World!" and the enterprise and enthusiasm displayed by Manager Heath in keeping his city constantly in the lime-light are productive of beneficial results to the entire population. It proves what the manager of an office can do when he has the interest of his community at heart.

THE CABLE.

Mr. Wm. Hannah, manager of the Central and South American Telegraph Company at Panama, has been appointed assistant to vice-president J. Leonard Merrill, of this company, with headquarters in New York. Mr. W. E. Russell, formerly of Fisherman's Point, Guantanamo Bay, Cuba, has been appointed acting manager at Panama, vice Mr. Hannah. Mr. Hannah is an old employe in the company's service, having occupied positions of acting manager at Iquique, Chile, and Santiago, Chile.

Guarding Cable Stations.—Guardsmen are now protecting the cable stations of the Commercial Cable Company and of the Western Union Telegraph Company at Rockaway Beach, L. I.

Cable Censorship Regulations.—All cablegrams to and from the United States must now conform to the United States censorship regulations. These regulations are practically the same as the British and French regulations, which have been in force since August, 1914, and will make no change in transatlantic cablegrams except transatlantic cablegrams via Europe to South America. These cablegrams will now be subject to the same restrictions as other transatlantic cablegrams. They must be written in plain lanuage, either English or French, or in one of the authorized codes and be signed by the name of the firm, or in the case of an individual by at least the surname. Cablegrams to Cuba and Porto Rico, and cablegrams, via San Francisco, to Hawaii, Guam, the Philippines, China and Japan, etc., are now subject to practically the same restrictions as transatlantic cablegrams, except that code addresses registered prior to January 1, 1917, may continue to be used and messages in plain language may be in English, French or Spanish.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to May 11, 1917, as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable), October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917; Martinique-Paramaribo, April 10, 1917; Cap St. Jacques-Doson, April 13, 1917.

CANADIAN NOTES.

GREAT NORTH WESTERN.

Mr. Geo. D. Perry, general manager, will shortly leave for an inspection trip throughout the West.

R. V. Aubin, aged thirty-two years, manager of the Quebec office of this company, died in Ottawa, April 17, of heart trouble. He was in the service of this company since 1906, and was manager of the House of Commons office at Ottawa in 1912. He was appointed manager at Quebec in November, 1914. Mr. Aubin was Quebec agent for Telegraph and Telephone Age.

This Company announces an emergency bonus payable to married men to assist them to meet the conditions caused by the high cost of living.

Mr. C. E. Davies, traffic superintendent, Great North Western Telegraph Company, Toronto, Ont., was in New York recently on company business.

Messrs. George Hogarth and C. E. Lillie have been appointed commercial manager and local manager, respectively, of the Great North Western Telegraph Company at Toronto, Ont. These appointments were made to meet the steady increase in the company's business. Mr. Hogarth has been in the company's service over thirty-five years and Mr. Lillie more than fifteen years. Both gentlemen are efficient and valued officials.

H. A. Logan, Wounded Soldier, Drowned.—In the May 1 issue, under the head of Canadian Notes, a paragraph appeared stating that Harold A. Logan, formerly manager of the Great North Western Telegraph office at Belleville, Ont., who two years ago, had enlisted for overseas service, had been wounded while fighting in France. A later dispatch states that he was being conveyed from France to England on a hospital ship, which was torpedoed, and was drowned. Mr. Logan's home was in Halifax. He was wounded in both arms and had spent some time in a hospital in France.

THE TELEPHONE.

Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company, has returned from Jekyll Island, Ga.

Mr. Union N. Bethell, senior vice-president of the American Telephone and Telegraph Company, has been appointed a member of the commission to investigate the condition of state institutions in New Jersey.

*The Telephone In Japan.

BY CHUGO OHIRA.

The telephone and telegraph systems in Japan are not merely public utilities; they are government necessities. With regard to the telephone system, because of its being under government control, it differs much from the system in America; the installation of telephones is made only within the limits of the national budget, and the charges for service are based on an annual flat rate, irrespective of the number of calls made.

The demand for telephone extension has recently been growing so rapidly that without speedy installation great inconvenience is felt by the public. It was because of this inconvenience that many appeals were addressed to the government in 1916 by various Chambers of Commerce. To satisfy the demand the government incorporated in the budget for 1917-18 a substantial increase for telephones. This, however, has not been approved by the Diet, owing to the fact that last January the Diet was dissolved.

According to representations made last May by the Osaka Chamber of Commerce, there were 134,300 applications for telephone installation at the end of 1914 still to be taken care of. The practice of leaving unattended to so many applications for telephones for years is a phenomenon peculiar to Japan. It forces people who must have a telephone installed at once to buy from others their telephone rights, for which they are forced to pay large amounts of money. Such transactions usually take place through brokers, who nowadays do a very flourishing business in this particular line.

The delay in making installations is not due to the unremunerative nature of the telephone enterprise. During the first period, which extended from 1896 to 1903, this enterprise yielded a profit of 6 per cent. per annum, on an average, on the total capital invested. During the second period, 1907 to 1912, the profit increased to 18 per cent.; in 1914 the total receipts amounted to 15,690,000 yen, and expenditure to 6,210,000 yen, leaving a net profit of 9,480,000 yen, nearly 20 per cent. of the amount invested. The total receipts of 1916 are estimated at 20,000,000 yen. In view of the urgent necessity for telephone extension and the profitable nature of the work, the public has begun to demand that the telephone account be separated from the general account and made independent, so that the profit accruing from telephones may be devoted to the extension of telephone communication.

Also the past year found the Department of Communications considering plans for changing the present system of telephone charges. According to the department's report, each telephone in Tokio makes on an average twenty-two calls per day—an average much higher than that of American and European cities—while even in New York the average is only ten per day. Some telephones in Tokio make one hundred and even two hundred calls per day. The authorities believe that the public often

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*From the *Evening Post*.

make unnecessary calls because charges are not based on number of calls. Unnecessary calls prevent quick communication and cause inconvenience to those who have important messages to communicate. With the introduction of the American system, it is believed that telephone subscribers will find their telephones more useful, since they will not find the line "busy" so often when they wish to use the telephone.

J. W. George, aged forty years, district plant chief, American Telephone and Telegraph Company, Baltimore, Md., died April 29. Mr. George was a native of Maryland.

RADIO TELEGRAPHY.

Marconi Notes.

Mr. E. J. Nally, vice-president and general manager, and Mr. David Sarnoff, commercial manager, New York, recently spent two days in Washington in conference with the Navy Department.

Mr. E. J. Nally, vice-president and general manager of the Marconi Wireless Telegraph Company of America, New York, has issued a letter to employes of the company announcing that employes who have enrolled or may enroll in the naval or army reserves will continue to be protected under the company's life and accident insurance plan, subject to the rules and regulations governing its operation, so long as they remain in the government service; and their absence while so engaged will not break the continuity of their service and seniority benefits with the Marconi Company.

Mr. G. S. DeSousa, traffic manager, was in Boston last week on company business.

Owing to congestion of orders due to war conditions the Marconi Company is erecting a large addition to its works at Aldene, N. J. About 1,000 workmen will be employed in three shifts. It is expected that the extensions will be completed in June.

Mr. Mitsuru Sayeki, radio engineer, Department of Communications of the Japanese Government, who has been in New York several months investigating radio conditions, will sail for Tokyo on May 23 on the steamer "Persia Maru" from San Francisco. He will spend ten days in Honolulu in connection with the trans-Pacific radio circuit, which is now operated by the United States and Japanese Governments.

Marconi Company Wins An Important Patent Suit.

On May 8 the Circuit Court of Appeals, for the Second Circuit, handed down a unanimous opinion in favor of the Marconi Wireless Telegraph Company of America, in its suit brought against the DeForest Radio Telegraph and Telephone Company for infringement of the well-known Fleming patent.

The case was originally brought in the United States District Court of the Southern District of New York by the Marconi Company on this Fleming patent alleging that the DeForest Company's so-called "Audion" was an infringement. The defendant, the DeForest Company, set up a counter claim alleging that the Marconi Company's apparatus infringed nine DeForest patents. In the trial court, Judge Julius M. Mayer held that the Marconi Company's Fleming patent was a patent of great merit and of value, and was valid and had been infringed by the DeForest "Audion"; he also held that the Marconi Company's apparatus did not infringe seven patents of the DeForest Company. The Marconi Company confessed that the two other DeForest patents were good patents, as being improvements on its Fleming patent, and that the Marconi Company had used them to a slight extent.

In affirming the decree of Judge Mayer, Judge Hough, speaking for the Circuit Court of Appeals, said:

"We have no doubt that Fleming's patent displays invention, and of a very meritorious device."

As to the patents which the DeForest Company alleged that the Marconi Company had been infringing, the Court of Appeals held that six of them were not infringed and that a seventh was void.

The result, therefore, of this opinion, seems to be that the Marconi Company had the underlying or basic patent for what are called "vacuum" detectors, and that the DeForest Company has two patents for improvements on the basic Marconi Company's Fleming patent for these devices.

Police as Radio Operators.—Twenty-nine New York patrolmen who attended the school of wireless telegraphy at Police Headquarters have passed the examination successfully and received government licenses. The police department is operating several radio stations in connection with the service.

The Next Meeting of the Institute of Radio Engineers will be held in the Engineering Societies Building, New York, Wednesday evening, June 6. Prof. M. I. Pupin, president of the Institute, will present a paper on "Iron at Radio Frequencies."

Report of Federal Telegraph Company.—The Federal Telegraph Company has made the following report of its finances to the California Railroad Commission. Total fixed capital, $811,847.86; cash and deposits, $32,956; accounts receivable, $59,576.40; working assets, $156,214.06; total assets, $1,060,594.32. Capital stock, $100,000; notes payable, $279,771.59; accounts payable, $542,010.65; interest and taxes accrued, $1,370.10; reserves, $46,040.16; corporate surplus, $91,401.82; total, $1,060,594.32. Income account, December 31, 1916: Operating revenue, $294,582.47; operating expenses, $263,827.96; net operating revenue, $30,754.51; surplus on December 31, 1915, $6,647.31; surplus on December 31, 1916, $91,401.82.

OBITUARY.

J. W. Whitely, at one time in charge of the Ogden, Utah, and Sacramento, Cal., offices of the Western Union Telegraph Company, died suddenly of apoplexy in Ogden on April 17.

S. B. Rumsey, aged seventy-one years, an old-time railroad operator, and a member of the Society of the United States Military Telegraph Corps, died at Oakmont, Pa., March 18.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions following each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telephony.

PARTS OF A TELEPHONE INSTRUMENT.

The telephone instruments used by subscribers are of two general kinds,—the magneto type, used in villages and in the country, and the common battery type, generally used in cities and large towns. Both types are made in various forms for convenience, such as wall sets and desk sets, but these forms differ only in mechanical details.

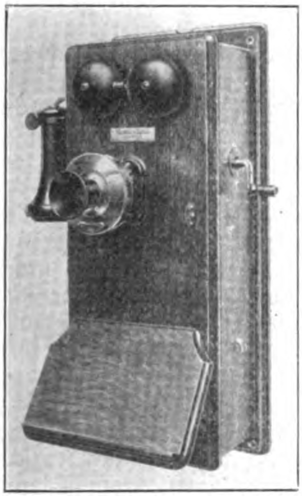


FIG. 1

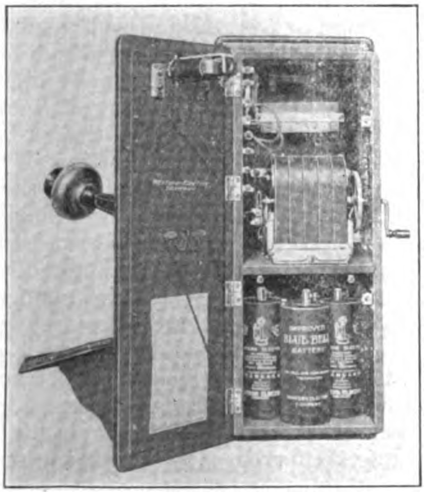


FIG. 1A

MAGNETO TELEPHONE SETS.

Fig. 1 shows a magneto wall set, both with the door closed and opened. Besides the transmitter and receiver, it contains a switchhook, three dry batteries, an induction coil, a hand generator and a bell or ringer. These are all shown in Fig. 2, with their electrical connections.

The switchhook is what the receiver is hung upon when not in use. The weight of the receiver pulls it down as shown in Fig. 2, and in this position the connections are such that a signal can be sent by the hand generator or received by the ringer while the battery circuit is open to prevent waste of current. When the receiver is lifted the hook moves upward and makes the connections suitable for talking.

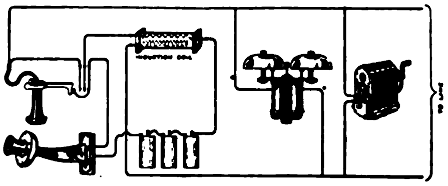


FIG. 2

The dry batteries furnish the current to the transmitter for talking. The induction coil, which may also be termed a transformer, is used to permit of conversations being held over long lines. It consists of a bundle of small soft iron wires, around which are placed a few turns of comparatively large wire called the primary winding, and many turns of small wire termed the secondary winding. The current obtained from the three batteries is of large volume and small intensity and would not flow over a long telephone line with satisfactory results, but when used in conjunction with the induction coil this current is changed in character so that it is of small volume and large intensity. When so changed, it is suitable for use on long telephone lines.

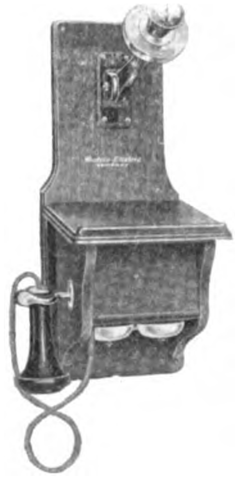


FIG. 3

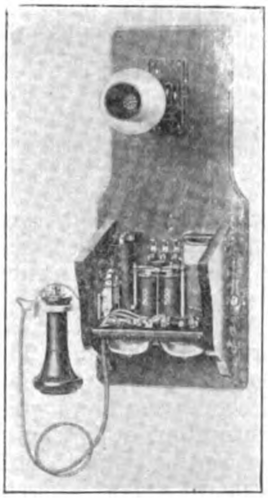


FIG. 3A

The hand generator is a small dynamo which creates a strong current when the crank is turned. This current goes out over the line to ring the bell at another telephone, or to operate a drop signal at the central office. The current generated is termed an alternating current, that is, its direction is continually being reversed, in this case about thirty-two times a second.

The ringer is a device placed in a telephone to receive and make audible, signals coming into that telephone. The ringer is operated by a current similar in character to that generated by the hand generator, and consists of an electromagnet, a permanent magnet and a soft iron armature or movable section to which is attached the clapper that strikes the bells. The electromagnet is a "U" shaped piece of iron, around which are wound a large number of turns of small wire. The permanent magnet, working in conjunction with the electromagnet when the latter is energized by the incoming alternating current causes the movable soft iron armature to assume one position and then another. This movement is in step with the alternating current and causes the clapper to strike the bells. This action continues as long as the ringer is receiving alternating current.

COMMON BATTERY TELEPHONE SET.

Figs. 3 and 4 show the common battery wall set and its separate parts. It contains a transmitter, receiver, switchhook, induction coil and ringer like the magneto set, but the dry batteries and the hand generator are omitted, all power for both talking and signaling the central office being obtained from one large storage battery located at the exchange. With a common battery set a subscriber cannot directly signal another one on the same line as he can with a magneto set. Therefore all calls must be handled by the central office operator when this system is used.

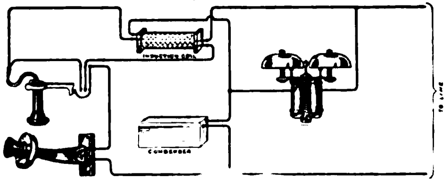


FIG. 4

When the receiver is on the switchhook the battery current cannot flow in the line to the instrument, but when the switchhook is allowed to rise, direct current flows, energizing both the subscriber's transmitters so he can talk and operating a relay at the central office to light a signal lamp. The subscriber's ringer is operated by an alternating current from a large generator at the central office. The current used to operate the ringer and the action of the ringer is the same as that just described.

The common battery set has one other piece of apparatus, namely, a condenser, the action of which is somewhat unique in that it will allow the passage of alternating current and will not allow the passage of direct current. A condenser is composed of two long sheets of tinfoil, separated from each other by paper. The two sheets of foil and the paper are wound together, then pressed to assume the shape shown in Fig. 4. The function of a condenser in a common battery telephone set is to keep the battery current out of the receiver when the set is in use, as such current is detrimental to the proper action of that instrument. It also opens the line to direct current when the set is not in use, and at the same time allows the alternating current to enter the ringer for signaling purposes. If a condenser were not used in the common battery set, the direct current from the central office battery would flow all the time and consequently would be wasted; signaling would be impossible.

QUESTIONS IN TELEPHONY.

How many types of telephone instruments are employed, and what are the names of the types?

What type is used in small towns, and in country districts, and what in large cities?

What part of the instrument is called the switchhook?

Does the switchhook perform any other function than that of merely supporting the receiver?

When the receiver is lifted from the hook what is the effect upon the connections?

What are dry batteries used for in connection with a telephone?

How is the induction coil constructed?

What is the hand generator and what is it used for?

Does the hand generator generate a direct or alternating current?

What is the ringer used for, and how is it operated?

What is the function of a condenser as used in telephony?

Radio Telegraphy.

POWER CIRCUITS.

After each oscillatory discharge the charge in the condenser is renewed at regular intervals by an induction coil, or alternating current transformer. The transformer is an apparatus for increasing the comparatively low voltage of an alternating current dynamo or generator to the high voltage necessary to cause the condenser charge to jump across the spark gap. The transformer consists of a primary winding of a comparatively few turns of heavy wire, wound on, but insulated from a laminated iron or iron-wire core, which carries the current from the alternator; a secondary winding of many turns of finer wire wound in sections and well insulated from all other parts of the transformer, which delivers a smaller current, but at the necessarily higher voltage, to the condenser that is charged thereby. In general the transformer increases the alternator or primary voltage in the same proportion as the number of secondary turns is increased over the number of the primary turns. The voltage of the alternator impressed on the primary of the transformer is usually 110 or 220 volts; the voltage of the secondary which is impressed on the condenser depends upon the size of the radio set and varies between, say, 10,000 and 30,000 volts.

In the case of quenched spark sets a transformer is generally used in which by a proper choice of the capacity connected to its secondary circuit, the secondary voltage is increased by resonance to perhaps twice as many times as the ratio of the primary and secondary turns would indicate. Such a transformer is called a resonance transformer.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

What is a transformer as used in radio telegraph outfits, and how is it made?

Is the wire used for the secondary turns heavier or lighter than that used for the primary turns?

What is the usual voltage of the alternator impressed on the primary of the transformer?

What is the voltage of the secondary impressed on the condenser?

Telegraphy.

ARRANGEMENT OF CELLS IN BATTERIES.

Cells in Series—When it is desired to obtain a greater electromotive force than that developed by one cell, a number of cells are connected, as in Fig. 1; the positive pole of the first cell being connected to the negative pole of the second cell; the positive of the second cell to the negative of the third cell, and so on.

Cells thus placed are said to be arranged in series. When thus arranged, the electromotive force of each cell is added to that of its neighbor, and the resulting electromotive force is equal to the sum of the electromotive forces of all the cells. Assuming the e. m. f. of each cell in Fig. 1 to be one volt, the total e. m. f. developed by the series will consequently be six volts, and, in the figure, the direction of the current in the external circuit is assumed to be from the positive pole at six, to zero, as indicated by the arrows; that is, from the point of high to the point of lower potential. As each cell increases the electromotive force by one volt, the e. m. f. at any one of the cells, that is, the difference of potential between that cell and zero, will be found to be, practically, as indicated by the figures.

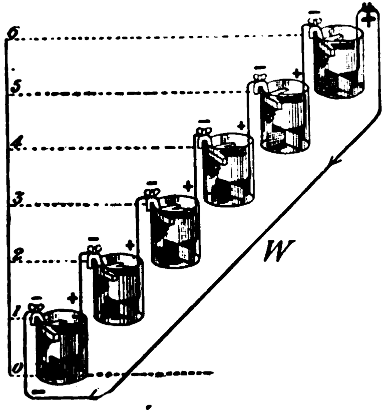


FIG. 1

(To be continued)

QUESTIONS IN TELEGRAPHY.

When it is desired to obtain increased electromotive force from a battery, how are the cells connected?

When cells are connected so that one discharges into the next, the second into the third, and so on, what is such an arrangement called?

When cells are arranged in series, by how much does each cell increase the total electromotive force?

Shop Talk.

BY THE OBSERVER.

Mention having been made to the assistance the men along the route can lend, that is, assisting to "break the other fellow" during wet weather; caution also having been suggested that you do not cry "ham," or use invectives or blasphemy, it is certain that the operator who treats his fellow laborers in a friendly manner has a right to expect friendly treatment in return. Think it over. All things considered, I believe all will agree that the friendly spirit is not only one that will cause the boys along the line to do their utmost to assist, but it makes the day's work one of pleasure.

It has been the practice for a long time, when you cannot raise a way office within a reasonable time, to send a message to the train dispatcher asking him to assist. Right here is where, on many railroads, the other way offices can help. It is over the block telephone. If more traffic supervisors would become familiar with the block telephone and ask the proper office to telephone the party desired to answer, quicker results would be obtained than by wiring the train dispatcher. Another thing to be gained by a friendly spirit is to get the way offices to call up and ask "5" now and then, and also to get them to compare the number sheet before they close the office for the night. In looking over Form 3338 I often wonder what necessity there is for such a form. The way offices are under the supervision of a superintendent of telegraph and such restrictions should be placed that no office be allowed to close without comparing numbers. If this were universally done an operator going from one road to another would know that it was one of his duties to compare numbers and he would do so. There is no valid argument that I have ever heard which will dispute the practicability of comparing numbers before closing.

I know there are many offices that do call up and compare numbers, and I also know that some operators in the main office fail to record it. To fail to make a record is an error, and if any one makes a practice of such errors he should be severely dealt with.

Right here is where I wish to make a suggestion, and, if heeded, will redound to your pride and credit. Learn to mark off numbers, comparing of numbers, and in placing your sending marks and time on a message, do it so that it will be easily read, for while you may not think it, let me assure you that some of the messages that bear your sending marks cannot be read by many, and in a few cases by not even yourself a few days later.

(To be continued)

GUESS AGAIN.—A telegraph official informs us that some time ago his face seemed to break out in spots, which were rather painful. He consulted the family doctor, who informed him that he had better change barbers; that he was suffering from barber's itch, which was a result of visiting unsanitary barber shops. The official had always shaved himself.

Mr. C. F. Ames, superintendent, Western Union Telegraph Company, Boston, Mass., in remitting to cover his subscription for another year, writes: "I appreciate the AGE every time it lands on my desk. May you never run short of print paper or be torpedoed."

How to Clean and Oil a Gill Selector.

(Concluded from page 210, May 1)

The four screws having been removed, the selector mechanism can then be lifted from the base without straining or bending any of the parts.

If the selector is very old it may have a counterweight attached to the propelling arm and extending through a hole in the armature to a point between the coils. In this case lift the mechanism until the connecting rod (17, Fig. 3) is free from the hole in the driving spring (3, Fig. 4) and then draw the mechanism forward until the counterweight clears the hole in the armature.

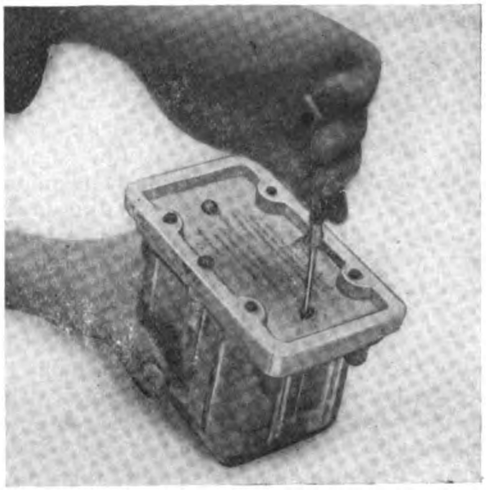


FIG. 7

The next step is to soak the entire mechanism in "Carbona" for about three minutes. This dissolves most of the gummed oil, and the part which is not dissolved is softened to such an extent that it can readily be removed by scrubbing with a brush as illustrated in Fig. 12. Do not prolong the soaking operation unnecessarily because this will injure the lacquer used on the brass side plates.

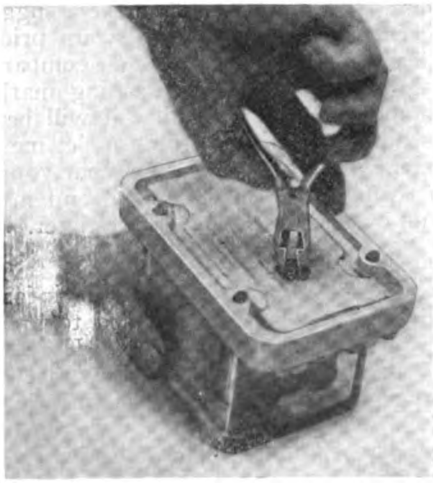


FIG. 8

The scrubbing operation illustrated in Fig. 12 must be conducted with reasonable care so as to avoid bending any of the parts or altering any of the adjustments.

In scrubbing, pay particular attention to the time-wheel track, the outside ends of the pivot bearings where they may protrude through the frame and the cut combination teeth on the combination wheel. In order to reach these teeth it will be necessary to move the combination wheel around about one quarter turn and hold it in that position with the finger while scrubbing.

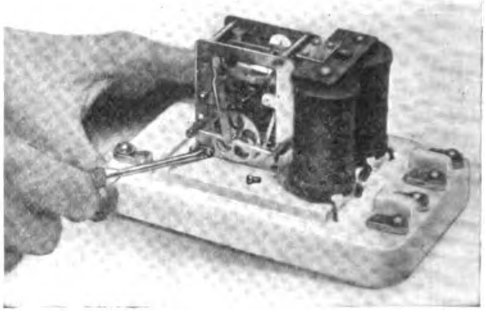


FIG. 9

When you are satisfied that all of the gummed oil has been removed from the mechanism, carefully protect it from dust and place it aside to dry. This will require about 10 minutes. If a few drops of oil have been added to the "Carbona" used in the cleansing operation a thin film of such oil will remain on all of the parts after the "Carbona" has evaporated, and this will effectually prevent subsequent rusting of the steel parts. (Read paragraph 7 under Fig. 6).

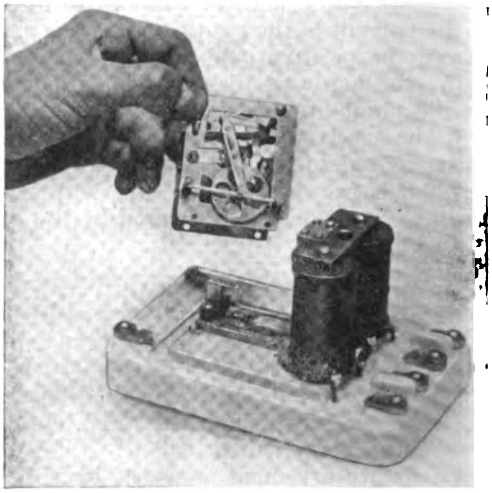


FIG. 10

Be very careful that no other foreign substance

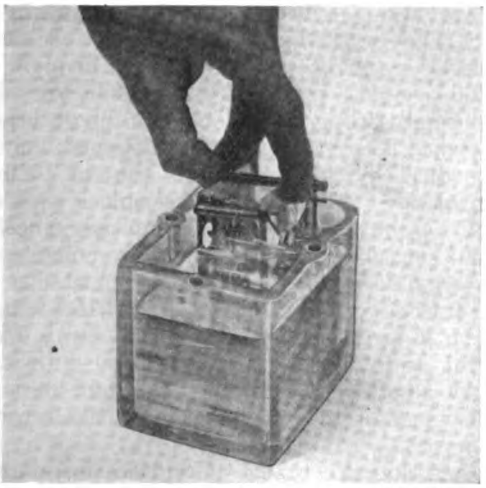


FIG. 11

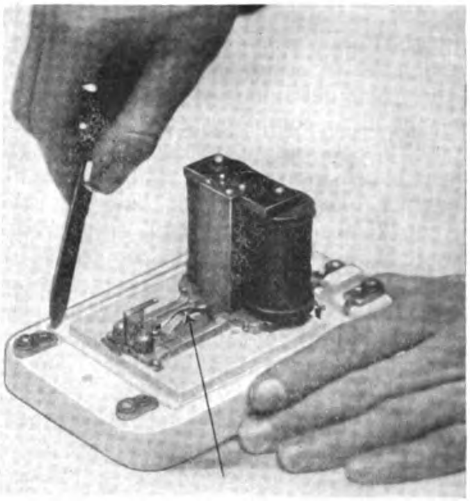


FIG. 14

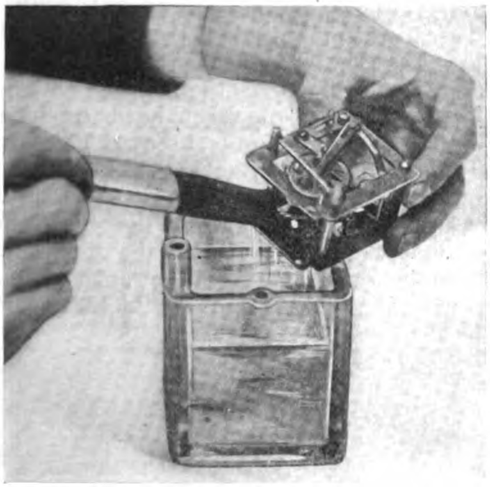


FIG. 12

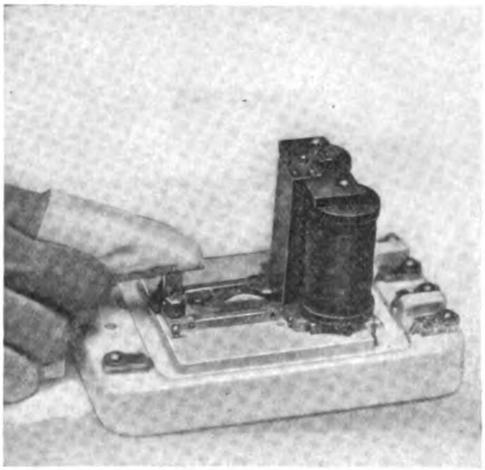


FIG. 15

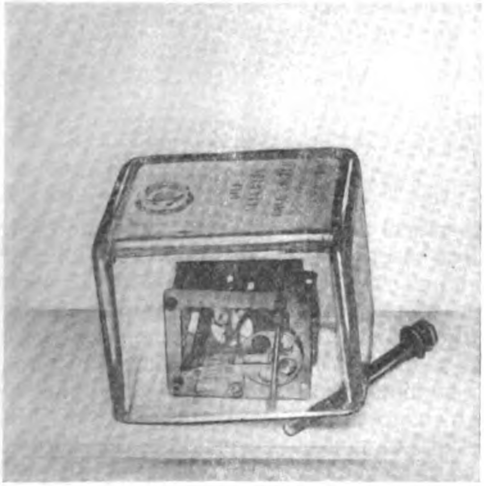


FIG. 13

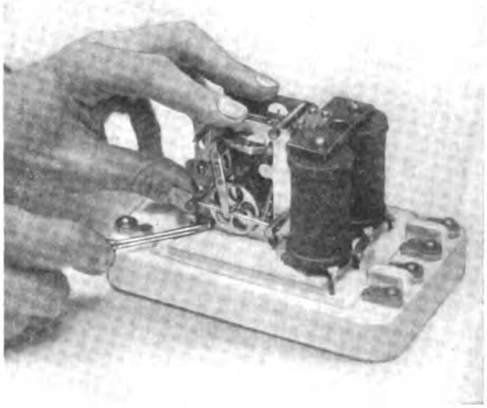


FIG. 16

HOW TO CLEAN AND OIL A GILL SELECTOR.

becomes dissolved in the "Carbona." A flake of paraffine, for instance, is readily soluble in this fluid, and of course, when the "Carbona" has evaporated a deposit of solid paraffine will be left behind to the great detriment of the bearings.

When you have completed the scrubbing operation, carefully skim off all particles of foreign matter, such as brush bristles, etc., that may be floating on the surface of the "Carbona" and rebottle it at once. Keep "Carbona" in a well stoppered bottle and allow it to be exposed to the air for as short a time as possible, because it evaporates very rapidly and evaporation appears to alter its composition to a certain extent and to render it less satisfactory as a cleaning agent for this purpose. Do not attempt to clean more than thirty selector mechanisms in one lot of "Carbona."

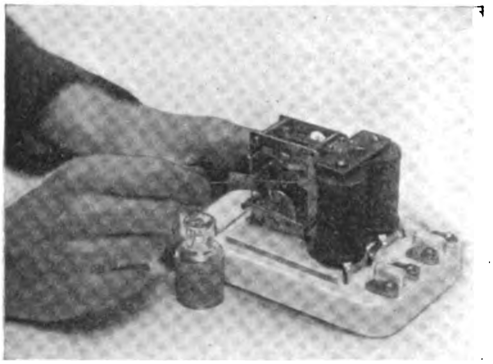


FIG. 17

While the mechanism is drying, you can find time to clean the base and cover, scraping away the old paraffine and removing all loose particles of dirt that might eventually find their way into the selector mechanism. Clean the driving spring with cheese-cloth moistened with "Carbona," and apply a small drop of oil to the edges of the hole in the driving spring indicated by the arrow. The tension on this spring is adjusted at the factory by means of the screw at the front of the white metal frame casting. This adjustment does not change in service and should not be altered unless you are certain that such readjustment is absolutely necessary for some special reason.

Before replacing the selector mechanism, be sure that the contacts are clean. Nearly all of the black deposit on the contacts can be wiped off with the cheese-cloth. If the contacts are pitted slightly, scrape out the cavities with the point of a knife. Take great care not to bend or alter the adjustment of either of the two contact brackets in this operation.

After assuring yourself that no loose particles of dirt adhere to the selector base, you can now replace the selector mechanism. Guide the connecting rod into the hole in the driving spring with the screw-driver, and after the mechanism has been properly seated, press it down firmly against the base, and back against the bottom heel iron, using the fingers in the position indicated. The four screws that hold the selector mechanism to the base can now be replaced. You will notice that these screws enter a white-metal casting, the threads in which can be easily stripped, therefore use only enough pressure to set the screws firmly.

You are now ready to oil the selector. Place a very small drop of oil on each pivot bearing, a somewhat larger drop on the grooved hub of the time wheel; oil very sparingly the cut combination teeth on the combination wheel; place a small drop of oil on the side of the combination wheel below the cut combination teeth. Always remember that a large drop of oil used on such small parts has exactly the same effect as no oil at all, for the reason that the large drop will tend to flow away from the bearing and draw the rest of the oil with it. Only a very small drop of oil will adhere permanently to bearings of the size used in this selector mechanism.

When you are ready to replace the glass cover, be sure that no loose particles of paraffine adhere to the inside, from which position they could easily fall into the selector mechanism. When you have assured yourself on this point, replace the cover, and be careful not to crack the glass in tightening the screws or nuts. Then with a brush draw hot paraffine along the edges of the glass cover, and by the same means seal the screw heads or the exposed ends of the bolt and nuts used to hold the glass cover to the base. Try to seal the selector so that it could be placed under water without injury; but be careful that no hot paraffine flows into the interior of the selector cover during the operation.

When the glass cover has been replaced and sealed with paraffine it is often advisable to improvise a paper seal and attach it to the under side of the selector base by means of mucilage or shellac. Such a seal, properly signed and dated by the person authorized to undertake the foregoing operations, will usually act as a deterrent to the ever present individual who feels that he has a sacred duty to perform in dismembering all moving devices, the operations of which are not perfectly apparent to him. This disaster having been forestalled, the selector can be placed in service, and it will be quite probable, if the foregoing routine has been scrupulously followed, that it will be in practically the same condition as a new instrument.

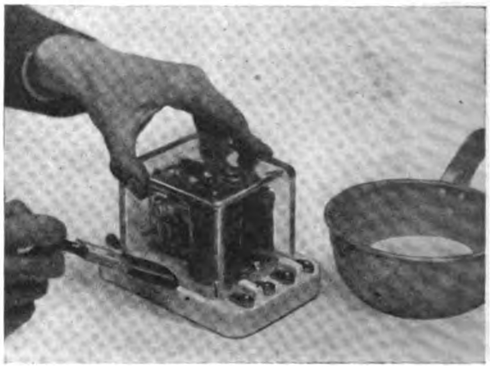


FIG. 18

Gill selectors now in service may have the old style or the new style base and cover. The old style is shown in Fig. 7. In order to remove the old style cover break the paper seal over each of the four cover screws located as shown, and after removing as much paraffine as may be necessary, take out the screws. You are not likely to mistake these screws as their position is clearly indicated by the bushings in the glass cover; but be sure that you do not loosen any other screws, and especially the screws that secure the contact bracket at the front of the selector. After taking out the screws, hold the base and cover firmly together and turn the selector right-side-up. The cover can now be removed and if it is not quite loose pry it off with the screw driver.

To separate the new style base and cover, break the seal where the cover bolt extends through the base and remove the two nuts and washer. If it is necessary to pry off the glass cover you will find a groove in the porcelain at the front of the selector, which will enable you to reach the bottom of the glass cover with the screw driver.

Having removed the glass cover, proceed to separate the selector mechanism from the base by taking out four screws, two on each side of the mechanism, located as shown in Fig. 9.

Death of George W. Conkling, Champion Telegrapher.

George W. Conkling, aged forty-six years, who was adjudged the finest and one of the most rapid Morse senders in the United States, received injuries in an automobile accident on the night of April 30, from which he died at 3 o'clock the next morning. He, with his two sons, were identified with a garage in Ridgefield Park, N. J., where he resided. Mr. Conkling was demonstrating a new automobile when, in turning a corner, the machine upset fatally injuring him. One of his sons, DeWitt, who was with him, also received serious injuries, one of his legs being broken in three places besides suffering from concussion of the brain. Two other men who were in the car were injured, one of them quite seriously.

Mr. Conkling was born in Mountaindale, N. Y., December 22, 1871. After learning telegraphy he was employed by the Postal Telegraph-Cable Company at 187 Broadway, New York, where he soon became noted as a rapid telegrapher.

At the telegraph tournament in Madison Square Garden, New York, in 1898, he sent coded 345 words in five minutes, defeating his nearest competitor by fifteen words. He took part in many other tournaments and always carried off high honors. His work at the key was marvelously clean-cut and finished. He was no doubt the most perfect Phillips' Code sender in the country. He won first prize at the Philadelphia Telegraph Tournament in 1903 for perfect sending in Phillips' Code, easily defeating the most expert operators of that day. In a recent issue of this publication we recorded the fact that Mr. Conkling worked regularly the longest circuit in the world, which was the E. F. Hutton & Company's leased wire from New York to San Francisco with loops to San Diego on the south and Seattle and other places on the north, the total length of the circuit being 5,800 miles.

At different times he was employed by the Laffan News Bureau, the Associated Press, the United Press, the New York *Herald* and other papers, broker concerns and other interests, all of which were eager to secure his services.

Mr. Conkling's beautiful Morse sending is permanently recorded for future generations to admire on telegraph disc records which can be reproduced on talking machines. Although Mr. Conkling's familiar figure is gone, specimens of his fine Morse are preserved for all time to come. He was very popular and his untimely end was a great shock to the entire telegraphic fraternity.

Mr. Conkling was tall and of excellent physique and had always lived a clean life. Notwithstanding the fact that his lungs had been perforated, as well as his stomach and intestines by parts of the automobile machinery, he lived five hours after the accident. He is survived by his wife, mother and two sons besides three brothers.

Mr. F. M. McClintic, another one of our champion operators, has this to say regarding his dead friend: "It is no pleasant duty to write 'finis' over the name of a friend who was as close as George Conkling was to me, yet it is a privilege to have the opportunity to attest publicly the praise for him which was many times expressed during his life.

"No other telegrapher within my memory possessed the same all-round qualities as did George W. Conkling, not only as a finished operator, but a gentleman and a man whose friendship was an acknowledged honor.

"Last December at a birthday gathering of friends, Mr. Conkling recorded the closing prices of a day on the New York Stock Exchange on a Phillips receiving instrument, and this almost priceless embossed tape is now in my possession. Within a short time I hope to transfer the Morse characters to a phonographic record, so that telegraphers who desire, may hear a sample of Conkling's remarkably perfect work."

CIVIL SERVICE EXAMINATION FOR OPERATOR.—The United States Civil Service Commission will hold a competitive examination for telegraph operator, for both men and women. Competitors will be rated on physical ability and training and experience, and forms for the examination may be obtained of the Civil Service Commission at Washington and the secretaries of the United States Civil Service Board in the principal cities throughout the country. Applications will close on May 29. The salaries range from $900 to $1,200 a year at entrance.

"BILLY" SUNDAY PREDICTS A NEW INVENTION.—"Billy" Sunday, who is now conducting revival services in New York City, says this is a day of great inventions and that he expects to read before long that somebody has invented an Electrohuggographosqueezeophone, so that a fellow can stand in New York and hug and kiss his girl in Chicago.

Efficiency Engineering in the Telegraph Service.

(Continued from Page 199, May 1)

We have been requested several times to discuss more in detail the chapter on Service. It is a subject that appeals to everyone who earns a livelihood in the telegraph or telephone industries, and is one that enters into every department of a company as well as the private affairs of individuals.

From the moment a man rises in the morning he expects service. It is service and system in dressing; it is service that he expects at the breakfast table. He pays for service when he is conveyed from his place of residence to his place of business. When he reaches the office he renders a service and others who depend upon its efficiency insist that the service be well performed.

It must be remembered by all that a business or service will never be bigger or better than the man that heads the company. A man who earns the reputation of being big gets the most out of the plant in his charge without friction or annoyance to those who contribute to the success of a company. It is as easy to manage and control one thousand employes as it is five employes. System is necessary and big men study system. When system is thoroughly efficient service naturally results. We have in mind a young man less than thirty-five years of age, the head of a large telegraph office who has over 2,000 names on his pay roll. He manages this vast army of employes without worry or confusion. System and efficiency are exemplified on every side with the result that service, good service, is rendered. This large plant is so organized that it is actually as flexible as a rubber band. It is organized on a normal day's business but should a sudden emergency arise and the business is actually doubled in volume the machinery to take care of the excess traffic is so perfect that to the casual observer there is no apparent evidence of unusual business activities. Additional circuits are brought into use, twice the number of messages are conveyed to the various operating tables but the work is performed in such a quiet manner that the employes themselves will probably not observe that there is anything unusual transpiring.

A manager, chief operator, superintendent, general manager or even the president of a company is obliged to render service if he wishes to avoid confusion and complaints. A customer who sends one twenty-five cent telegram and does not obtain what he considers service kicks up a row about it that is heard and felt in every department of the company. In these days he can even go further. He can lodge his complaint for investigation and adjustment before the Interstate Commerce Commission. Therefore, the investor in twenty-five cents' worth of service can make it very uncomfortable for a telegraph or telephone company if he thinks he has not been treated fairly.

It used to be that a manager could say to a complaining customer, "What are you going to do about it?" If that question was advanced to a customer in these days his reply would most likely be "I will show you"—and he would.

The plant department of a company is expected to render an efficient service at all times. It should constantly be keyed up to the highest efficiency. Supposing all of the circuits entering a large telegraph office were interrupted at the same moment, which is occasionally the case; imagine if you can the delay in traffic, the expensive operating plant laying idle, the receiving department notifying all customers that the service is temporarily interrupted, in short the expenses at the maximum and the income at a minimum. Under such conditions does not everyone turn his attention and thoughts to the plant department and wonder whether it is sufficiently efficient to restore communication before the rush of the day is over? It is important that the plant employes render an efficient service in emergencies of this character. There are no hard and fast rules governing the restoration of such breaks. Sometimes every effort is made to restore one or two wires at a time, then adding to the number. It is realized that a few wires are better than none at all. Again a break may be of such a nature that it is impossible to restore the wires one at a time. The construction foreman under such circumstances is expected to use his best judgment in mending conditions and in this way he renders the best possible service to his employing interests.

(To be continued)

Wire Censorship In Effect.

President Wilson has signed an executive order providing for a military censorship over submarine cables, and over telegraph and telephone lines along the Mexican border. The order went into effect May 1, and is broad enough to enable the army to exercise a censorship over telegraph and telephone lines going from this country to Canada but a censorship of telegraph and telephone wires will for the present affect only the Mexican border.

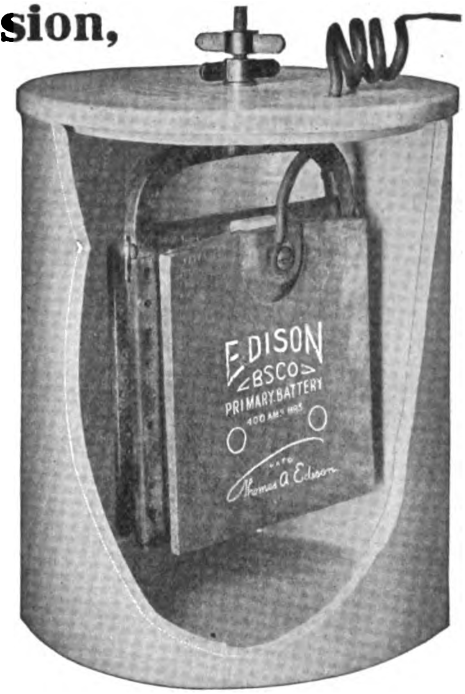
The Navy has charge of the cable censorship and the Army that of the telegraph and telephone lines. Secretary Josephus Daniels, of the Navy, has assigned Commander David W. Todd, director of naval communications, to have charge of the cable censorship. Commander Arthur B. Hoff will have charge of the New York division of the cable censorship. Brigadier-General Frank McIntyre, chief of the bureau of Insular Affairs of the War Department, will direct the telegraph and telephone censorship on the Mexican border. All submarine cable lines approaching American shores are covered by the censorship.

Commander Hoff will have a corps of 100 assistants from the Navy Department, and his headquarters will be in New York City. Commander Hoff, who is a graduate of Annapolis, has been since June, 1914, Industrial Commissioner for the Erie Railroad.

Before you condemn a man look over your own record.

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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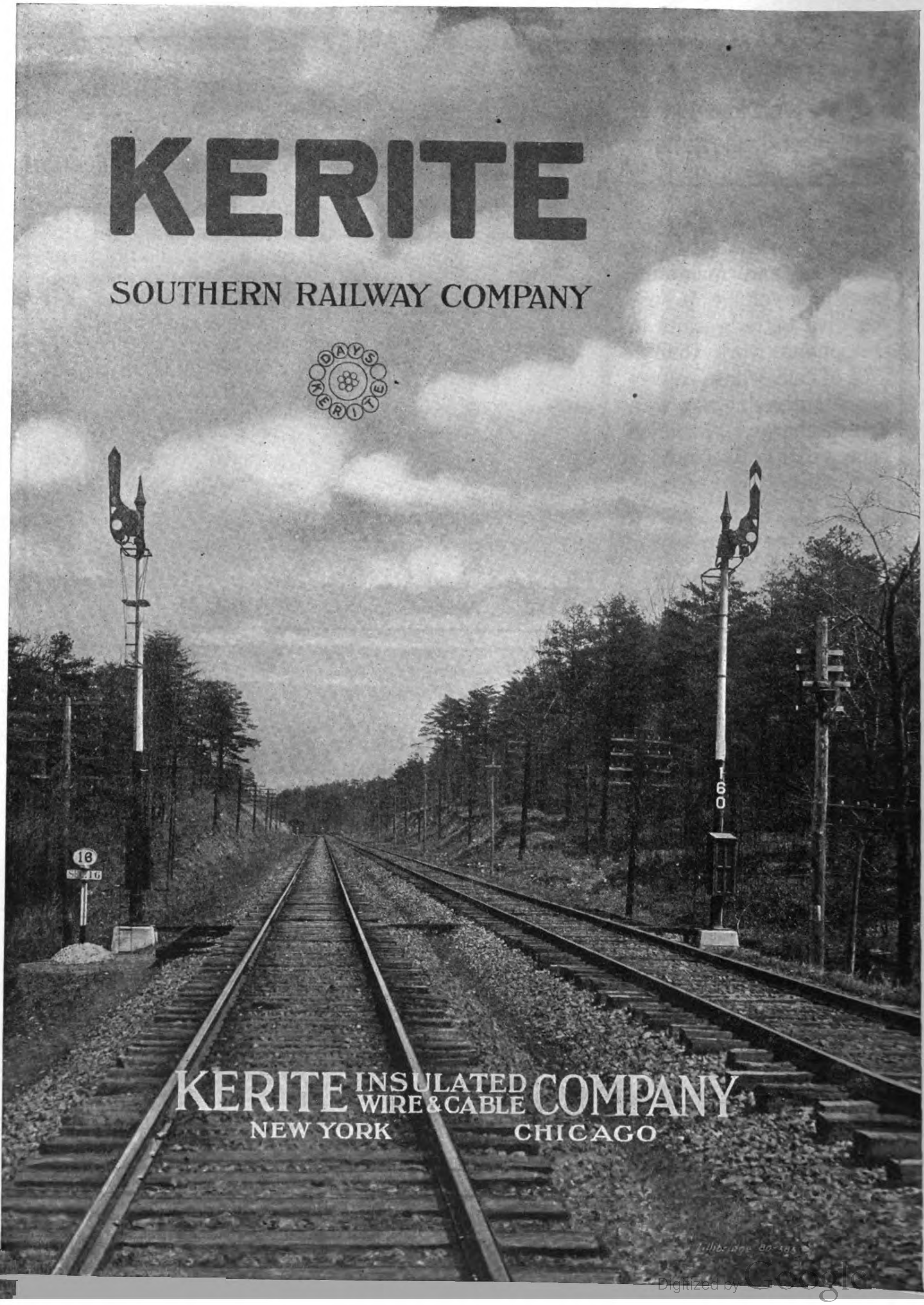

KERITE

SOUTHERN RAILWAY COMPANY

DAYS KERITE

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO

THE RAILROAD.

THE MISSOURI, KANSAS AND TEXAS RAILWAY has recently reduced its telegraph force by cutting out a large volume of business formerly handled by telegraph, also by the installation of printers. Mr. W. H. Hall, Denison, Tex., is general superintendent of telegraph.

MEETING OF NEW YORK CENTRAL TELEGRAPH SUPERINTENDENTS.—The New York Central Lines' superintendents of telegraph held their regular quarterly meeting in the office of Mr. J. J. Ross, superintendent of telegraph, Michigan Central Railroad, Detroit, Mich., Wednesday, May 9, at which time regular routine matters were considered. In attendance were Messrs. E. C. Keenan, general superintendent of telegraph, and A. B. Taylor, superintendent of telegraph, New York; R. F. Finley, Cleveland; C. S. Rhoads, Indianapolis; W. L. Connelly, Gibson, Ind.; J. J. Ross, Detroit; L. A. Lee, Pittsburgh, and B. J. Schwendt, superintendent of telegraph and signals of the Toledo and Ohio Central, Columbus, Ohio.

THE PENNSYLVANIA RAILROAD COMPANY has opened a new telephone system for train dispatching between Elmira and Williamsport, Pa., a distance of about 75 miles. The selectors used are of the alternating current type and in many respects are a decided improvement over the earlier types of selectors for telephone train dispatching. Telephones are placed in each station and tower and the movement of trains is now conducted by telephone instead of telegraph as heretofore. The remaining half of the local divison from Elmira to Canandaigua and Sodus Point it is expected will be completed and installed by June 1. Mr. J. C. Johnson is superintendent of telegraph of the Pennsylvania Railroad Company with headquarters at Philadelphia.

Mr. Gaunt on Co-operation.

At the recent meeting in Chicago of the Western Division of the Association of Railway Telegraph Superintendents, Mr. C. H. Gaunt, general manager Western Division, Western Union Telegraph Company, Chicago, made a few observations on co-operation that are considered extremely important at this time.

"Co-operation," he said, "is in one respect at least, like loyalty, and like virtue. It is like these estimable personal attributes in that it does not need to be extensively talked about. Its expression is found chiefly in deeds and not in words. And if I may be permitted to paraphrase the golden rule in its behalf, I should say that a proper definition of 'co-operation' is: Do for others what you would wish them to do for you had they your opportunity of so doing.

"Statistics have shown that about fifteen per cent. of the gross revenue of the telegraph company comes from the railroads, and I have heard that statement made in an effort to minimize the importance of the railroad revenue to the company which I represent. Nothing could be further from justice in such a matter, and the very great importance which this revenue represents will be made more apparent when I call to your mind the fact that fifteen per cent. of the gross revenues of the Western Union Company is more than has ever been paid to the stockholders and placed in the surplus during any year of its operation. Therefore, without this fifteen per cent. the company must necessarily be, in the parlance of the railroad auditor, 'in the red,' as costs to the company upon the railroads do not vary much with the receipts. And so, the value of your own co-operation in the revenues of the Western Union is made apparent, and for that co-operation and its attendant results the company through me wishes to thank you."

New Method of Manufacturing Concrete Poles.

At the meeting of the Western Division of the Association of Railway Telegraph Superintendents in Chicago, April 18 and 19, Mr. Walter H. Lienesch, consulting engineer of the Universal Concrete Products Company, Chicago, described a simple machine, recently perfected, for the manufacture of concrete poles. It employs the principle of centrifugal force to produce a round hollow pole, possessing desirable qualities.

The process of manufacture was described as follows:

The lower half of a circular metal form is placed on rollers set in line with the special machine, which is constructed so as to revolve the form in a horizontal position. This half form is filled with wet concrete material, a fabricated cage of reinforcing steel is laid into the concrete, the upper half of the form is placed in position and the entire form, concrete and steel, is rolled into the machine. Special clamps in the machine hold the halves of the form together. After the form is securely clamped in place it is revolved for a period of several minutes at a high rate of speed. During this action the centrifugal force which is developed causes the concrete to be compressed against the inside of the form with a pressure varying from 75 to 300 pounds per square inch producing a dense concrete structure having a smooth hole through the center and walls tapering in thickness from end to end.

During the mechanical action of this process, all air bubbles and other voids are eliminated from the plastic mass of concrete, owing to the difference in specific gravity between water and the aggregate, the water is caused to flow toward the center and it is finally expelled from the pole by pouring out of the large end. The immediate elimination of a great percentage of moisture, causes the plastic material to set up into a firm body which bears considerable rough handling before the initial set has occurred in the cement.

Immediately after the pole is turned, it is removed, in the form, from the machine and allowed to set for a period of twelve hours, after which the upper half of the form is removed and the finished pole is rolled out of the lower half into a bed of fine sand. The pole is then allowed to harden for ninety-six hours, at which time it is removed to a storage yard and is ready for shipment after being cured under water for a period of ten days.

The forms and steel cages of reinforcement used in connection with the centrifugal process are so constructed that the steel is retained in the center of the concrete protection along the entire pole length. The steel cages are woven in a special loom which spaces the longitudinal bars accurately about the perimeter of the cage and winds them with an exterior spiral of steel wire having a varying pitch which is closest at the base of the cage. The use of numerous small units of steel, some of which are stopped off at various points along the length of the pole, permits the graduation of sectional area from a minimum at the top to a maximum at the ground line. The combined action of the exterior spirals together with the varying thickness of the concrete inside of the cages, prevents the bars from buckling in any direction so that the full compression value of the steel is developed along the entire length of the bars, giving the pole a varying strength, which is greatest at the ground line. The weight of a properly designed centrifugal pole is fifty per cent. less than that of any solid concrete pole of equal strength, and only two and one-half times that of the best cedar poles, which have only one-half the strength of the concrete pole.

The design of centrifugal poles has been made with reference to three classes of loading. Assuming wire spans of 100 feet with twenty per cent. of the total pole length in the ground, Class A will withstand a horizontal pull of 4,500 pounds applied at a point five feet from the top; Class B, 2,650 pounds three feet from the top; and Class C, 1,500 pounds one and one-half feet from the top. A standard taper equal to one-quarter inch per foot of pole length has been adopted.

Although the round hollow pole is the lightest concrete pole that can be produced for a given strength, the transportation of such poles is a serious problem from a cost standpoint and in order to offset this objection, plans have been made to establish plants at advantageous points so that this product can be delivered anywhere in the country at a reasonable cost. Mr. Lienesch stated that a thirty-five-foot pole has been bent thirty-one inches from the vertical before it took a permanent set. As to price, he estimated under normal conditions, that the concrete pole will be twenty-five per cent. higher than an untreated cedar pole in the Chicago district.

INDUSTRIAL.

VERTICAL VIBROPLEX.—Mr. Horace G. Martin, inventor of the Vibroplex, has perfected a vertical vibroplex for which many points of advantage are claimed. It is being placed upon the market by the Vibroplex Company, New York. The vertical instrument is an improved type of the single-contact instrument and is so simple that repairs, adjustments and replacements are reduced to a minimum. It has, besides, a very easy touch. It is light in weight and small enough to carry in the coat pocket. This instrument is for sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York. Price $15.00.

DIAPHRAGM SOUNDER.—The Diaphragm Sounder of the Railways Labor-Saving Device Company, Davenport, Iowa, it is stated, performs better service at less expense than any sounder on the market. It eliminates the local battery entirely at a consequent much less cost for operation and maintenance. It fits any relay in use and is easily applied. It is now used on over 100 railroads and by the United States Government and is giving satisfactory results.

Graphophone Company's Telegraph Facilities.

The *Tone-arm* published by the American Graphophone Company at Bridgeport, Conn., prints the following in its current issue:

"The west plant became more firmly connected with the center of the city and in a general way with the outside business world on March 17 when electricians from the Western Union Telegraph Company put the finishing touches to the installation of a local wire to the Fairfield avenue office of the Western Union.

"The taking on of a Western Union loop by the Graphophone Company gives the company its second line of telegraphic communication to the downtown offices, the Postal Telegraph-Cable Company having installed the first wire in February, and again brings to the fore the immovable stand taken many years ago by Mr. Walter P. Phillips, who maintained that every large and small manufacturing concern should have its own private telegraph wire. Managers everywhere are seeing the light, and practically all of Bridgeport's big companies are using the telegraph to considerable advantage.

"Mr. W. Z. Gardner of the file department, will preside over both wires, the telegraph instruments having been installed there. Messages received over the Western Union wire will be copied by typewriter from the sounder onto regulation Western Union blanks, which process immediately eliminates the taking of pencil notes of a message from the telephone and then transcribing into typewritten form, and all Postal messages will take the same course as they have been doing since that wire came in.

"All messages sent out from the factory will be typewritten at the department originating them, on the company's private telegram blanks and sent in duplicate to the telegraph department. They will be sent promptly, the typewritten messages timed and the original copy returned to the department sending it. Thus, all incoming and outgoing messages will be distinctive and separate from each other and the business brought under an efficient and centralizing system.

"'Use the telegraph,' has been the constant advocacy of Mr. Phillips—and it is being used, not only more extensively than ever, but with steadily increasing success. Little business is using it, big business is using it, and our company is leading the leaders."

The Bible in the Telegraph Office.

BY J. W. HAYES.

The introduction of the Bible into the public schools has long engaged the attention of the nation and has been a matter of much controversy, but the introduction of the Bible into the telegraph office has always seemed inadvisable and there is no mention of that book in the regulation requisition blanks issued by the telegraph companies.

However, there was a time when the advent of a Bible in the San Francisco office served a good turn to both operator and company, as I will relate.

Away back, on the verge of time, in the southern part of the state of Oregon, the remnants of the once powerful Modoc nation were making a last stand against the encroachments of the whites. It was to be a struggle to the death and the Indians had resolved to sell their lives and liberty dearly.

Many depredations had been committed, General Canby, the pride of the army, falling a victim to the treachery of Captain Jack, chief of the Modocs, who, with his premier, Shacknasty Jim, were the leading spirits in the uprise.

General O. O. Howard, a mild and Christian-like warrior, succeeded General Canby as commanding officer of the expedition against the Modocs. General Howard's plan was to save his army as much as possible from fatalities, and for this reason exercised much caution in dealing with the savages, evidently believing in the old saying, "He who fights and runs away will live to fight another day."

So long drawn out was this campaign that some alleged humorist wrote, "General Oh, Oh, how'ard you are trying to catch Captain Jack." But to the story.

As usual, the enterprising New York papers had gifted representatives in the field, the *Herald* being a little bit more pushing than the rest.

The end had finally arrived and General Howard's strategy had won the day, the Indians being completely surrounded and an unconditional surrender was hourly expected.

The whole country was agog with anxious excitement and anticipation.

"We have 'em," ejaculated Bob Foster, field correspondent for the *New York Herald,* "and Captain Jack and his tribe will surrender before sundown. I am off now and will return about midnight. I want to have my matter go ahead of everything and we are ready to pay for the privilege; how can it be arranged?"

The operator was George Q. Stewart. He informed Foster that the *Herald* could have the exclusive use of the wire so long as he furnished manuscript sufficient to keep it busy, but just as soon as he was finished on matter filed for the *Herald,* the other papers would have their turn according to filing time.

"Is there anything filed right now?" asked the *Herald* correspondent.

"Nothing at all," replied Stewart.

"Then I will file some matter which has never before been put on the wires and you can keep sending from out of this book until I return, if that is going to hold the line for the *Herald,*" said Foster, as he produced a well-thumbed copy of the Bible.

"You can begin at the first chapter of Genesis and keep right along till I return; but, I say, cully, don't send too fast; save your speed till I come back with the good dope and then you can fire it in to beat the band."

Stewart took a look at the Bible to accustom himself to its contents and to acquaint himself a little with the subject he was going to send. It looked all right to him and he called "S. F."

When San Francisco responded he was told that "a man had filed a whole Bible for transmission to the *New York Herald* and that this was a chance to make a record for fast work."

Bob Hamilton was the San Francisco operator and he was certainly a bright, intelligent young man.

"I'll be with you in just ten minutes, and then you can go ahead and do your best," said Hamilton.

Repairing to a second hand book store opposite the telegraph office, young Hamilton purchased a copy of the Bible for which he paid four bits.

"I am all ready for you to go ahead now," said Bob to the Jacksonville operator, "and you can send your fastest."

"I am a Bible student and very familiar with the book, so I won't break you very much as I really know the book by heart," continued the laughing Hamilton and George Q. Stewart squared himself for the fray.

Fast and beautiful came the Morse characters over that little old No. 9 iron wire, conveying God's word to man. Many of the characters found a lodging place in the stunted pine trees on the high Sierras; some got lost in the mud in the Sacramento valley; a portion fell into the fog in the San Francisco Bay, but Bob Hamilton was right there, Johnnie on the spot, and he would tear out a page of the Bible, address it to *New York Herald* and turn it over to Horace Jones to speed along to Salt Lake.

"Why not have a heart to heart talk with Johnnie Grier at Salt Lake and tell him what we are really doing?" asked Jones, and it was decided to advise the Utah office the way to save labor.

Jack Morison was the receiving operator and with his lively intelligence, it did not take a second coaching to tell him what to do. Omaha, too, was taken into the confidence of the western operators, and he immediately supplied himself with a copy of the Holy Book.

Meanwhile, 10 o'clock, 11 o'clock, and midnight came and went and Stewart was faithfully staying by the goods, sending at the top-notch speed, wondering often if "S.F. was getting it, but too proud to ask such a question.

Cain had killed Abel, the Deluge and its great destruction had been transmitted and gray dawn was breaking.

About 7 a. m. Bob Foster dashed up to the telegraph office, note book in hand, ready to begin his account of the dramatic occurrences of the night previous.

The *Herald* had the line and was the first to give to the world the news of the surrender of Captain

Jack, Shacknasty Jim and the rest of the delectable tribe.

Stewart had averaged 2,000 words an hour, having more than 26,000 words to his credit as sent from the Bible.

Bob Hamilton was relieved by a day man, and his splendid achievement of "receiving" 26,000 words without breaking became historical with the "S.F." office.

This, however, is the only time on record that a telegraph company was known to purchase a Bible to be used in the business.

[In the late 40's, or early 50's, James D. Reid, general superintendent of the telegraph companies in the East, furnished the various telegraph offices with copies of the Bible, and the copy presented to the Philadelphia office is now on exhibition in that office in a suitable case constructed for the purpose. The Bible bears the autographs of famous operators of the early days of the telegraph, which proves that telegraphers, at one time at least, looked over the good book long enough to inscribe their names in it.]

Alta.

BY J. T. SPENCER.

Situated about twenty-eight miles southeast of Salt Lake City, and not far from the mouth of Little Cottonwood canyon, at an altitude of 9,300 feet, is the once famous mining camp of Alta. This camp gained considerable of a reputation in mining circles throughout this country, and also abroad, as the home of the celebrated Emma mine, which was owned almost exclusively by an English company, and also of the none the less well known Flagstaff mine, both of which during the early 70's were wonderfully rich producers. The output from each was such as to warrant the building of a smelter for each to treat the ores, and these smelters were located at the mouth of Little Cottonwood canyon and the ore hauled by teams from the mines to the smelters.

At this time Alta boasted of a population of about 2,500 people and the camp was in a flourishing condition, which continued until 1878.

The Deseret Telegraph Company built a line into Alta about 1870 and opened an office with Sol. Wixom as manager. Next came Alf. Davis, then Dick Morris, who was succeeded by his younger brother, Mel. Morris, and after him came John Fitzgerald.

Some events, both comic and tragic, were connected with the Alta office, a few of which this brief sketch will recall. It was during Dick Morris' term as operator at Alta that what I am about to relate is said to have taken place. It seems that young Dick stopped with Superintendent A. Milton Musser, of the Deseret Telegraph Company, at his home in Salt Lake City, and there learned to telegraph, and in due time went to work for the company as operator at Wasatch, being later transferred to Alta, and was manager there in 1874-5. At that time the Deseret Telegraph Company had quarters at Salt Lake City in the same office with the Western Union, and the Western Union operators took turns relieving the Deseret operator for meals, etc. At that time Billy Parr was manager of the Deseret and John Henderson acted in the same capacity for the Western Union, and among the Western Union operators was one John Morrison, who I believe is now with the same company in New York City. One day shortly after young Dick Morris had taken charge at Alta, a "cipher" message was received at Salt Lake City for the Emma mine at Alta, and, as the story goes, it fell to the lot of Mr. Morrison to relay this message to Alta. He called and raised "Ki," started in and finished sending the message, but could get no "ok" from Alta. Of course Jack wanted to know why, and Dick said "because he did not understand it—it did not read sense."

In vain did Jack try to explain that it could only be understood by the addressee, but Dick's conscientious scruples would not permit him to give "ok" to something he did not understand, and so this particular message, it is said, had to finally be mailed, with a written explanation as to the handling of similar messages in the future, and no further misunderstanding occurred.

Richard P. Morris has long since graduated from the telegraph profession and has creditably served Salt Lake City as city treasurer, mayor and commissioner, and is now a member of the well known Salt Lake brokerage firm of Evans, Morris and Whitney Company, with which company his brother, Melvin C. Morris, is also connected. Each of these operators took most desperate chances in accepting service at Alta, owing to the treacherous and extraordinary weather conditions to be met with at that point, as it usually starts snowing each year as early as August and by the following spring the snow has drifted to a depth of from fifteen to twenty feet. This immense amount of snow has been known many times to commence sliding almost without warning, causing death and destruction to everything in its path. But all of these men served their respective periods at Alta and escaped this danger except John Fitzgerald, who, while at work in the Alta office in 1878, which was then located in Strickley's store, was caught with others in one of these snow slides and instantly killed. He had come from Bingham to Alta, but was originally from the East. He was about thirty years of age at the time of his death. After this sad event, which completely destroyed the business portion of the town, Alta was abandoned and the telegraph office closed.

During the past few years Alta has again revived and considerable activity is evidenced, indicating that this old camp may yet prove one of Utah's best and safest mining districts.

By early summer the Salt Lake and Alta Railroad will be completed to the camp, and I am wondering who will succeed poor John Fitzgerald as manager of the Alta telegraph office.

Mr. L. E. Gallagher, chief operator, Western Union Telegraph Company, Wheeling, W. Va., writes: "Many thanks for renewing my subscription. Your business methods are on a par with the magazine you publish."

MR. JEFF W. HAYES' DEPARTMENT.

Address communications intended for the Chicago department to Jeff W. Hayes, Room 620, 111 West Jackson Boulevard, Chicago, Ill.

The Pleiades Club.

CHAPTER XIII.

The bright azure sky on the planet Mars, which serves as a bulletin board for its whilom dwellers, was covered with news from Mother Earth and the wireless electric pen was busy at work transcribing more items of interest to the sojourners.

News from Washington announcing the declaration of war excited some anxiety and apprehension and each article was read and debated upon by everyone. Secretary Fred. Moxon was kept busily engaged in deciphering the telepathic messages from his earthly friend and arranging them for the bulletin board.

"What, ho!" he cried, "here is something new," as he copied off the announcement of the passing of Charles Almerin Tinker.

"I dare say Mr. Tinker will not delay in climbing the Horeb Heights and he is most likely to arrive on the Thunderbolt Express which is due tomorrow," ejaculated Moxon, "and I believe that I will immediately bulletin the event, knowing that there will be many who will want to be among the first to welcome him to our Elysian home. President Lincoln and Secretary Edwin M. Stanton will want to meet their old friend and comrade; besides, there is a long list of members of the old United States Military Telegraph Corps who will be on hand when the express train arrives."

A bulletin was accordingly indited chronicling the passing of Mr. Tinker and announcing his expected arrival on the morrow, which attracted much attention.

A regiment, bearing banners with the legends, "Spirit of 1865," "The United States Military Telegraph Corps," etc., accompanied by several bands of music playing stirring airs, came down the line under the leadership of Col. Marquis D. Crain. The regiment was composed of admirers of Mr. Tinker and were mostly members of the United States Military Telegraph Corps, and all were eager to greet their former colleague.

Among those who were formed in line were the following: James E. Pettit, C. Fred Loomis, Hamilton Young, Ed P. Whitford, Thomas T. Eckert, Samuel Bruch, Jesse H. Bunnell, W. K. Applebaugh, C. D. Hammond, J. C. Van Duzer, Dennis Doren, Anson Stager, G. M. Brush, Eli Cole, H. W. Cowan, J. E. Gamble, Patrick Mullarkey, Douglass Kent, G. D. Sheldon and many others.

"I would like to be among those to escort my young friend to our Tabernacle," remarked President Lincoln, who could not think of Mr. Tinker in any other light than being "young," forgetting for the time being that he had not seen the gentleman for more than a half century. But time does not count in eternity. "I remember him so well, and I used to be greatly pleased to call him and his immediate colleagues 'The Sacred Three.'"

"See, what is that in the sky that looks like a comet?" was asked on all sides. "If this is the Thunderbolt Express it is twelve hours ahead of its record," and everybody hastened down to the spacious plaza where the big air machine from earth made her landing.

There was no screeching of whistles or ringing of bells, or cries from the omnipresent hack and cabmen. Instead of such distracting noises came the sound of many voices in patriotic melody, and in the midst of tuneful airs of "Hail Columbia" Charles A. Tinker was welcomed to a temporary abiding place on the planet Mars.

The meeting between President Lincoln and his former confidential operator was joyous, but not affecting, for there is only joy in this haven.

Mr. Lincoln and Mr. Tinker locked arms for a stroll, for both had much to talk about concerning past events. Mr. Tinker verified many of the reports already inscribed on the bulletin board and his patriotic words and spirit evoked a tumult of applause.

The evening was given over to a social demonstration, many of Mr. Tinker's contemporaries and former employes being in line to say some welcoming words to their old friend.

A committee of Confederate telegraphers during the Civil War, composed of George Ellsworth, David S. Ryan, J. C. Hueston, C. C. Chute, Barney Hughes, David Flanery, J. B. Tree, M. W. Barr, J. W. Kates and others, came around to pay their respects to Mr. Tinker and all distinctions and differences were forgotten.

General Grant, minus his once ever-present cigar, and the noted Sherman brothers, William Tecumseh and John, and many others of note, made an informal call on Mr. Tinker and bid him welcome.

Fred. B. Moxon, who Mr. Tinker recognized as having once been a page in the White House, shook hands with the great cipher operator, Mr. Moxon presenting Mr. Tinker with a deadhead pass over his telepathic wires to earth.

"This looks good to me," said Mr. Tinker. "I only hope, in using it, I will not be getting into trouble with the Interstate Commerce Commission."

"Never fear for that," said Charlie Hammond, who called to greet his old chieftain. "When you get rested I will take you down the Mow Pack from St. Louis to Houston, Tex., in my private car 'Telegraph,' and I will give you a life-long pass over the route, and lifetime here means eternity, if you want to remain here."

Mr. Tinker remarked, like St. Peter, that "It is good to be here," and the whole assemblage replied by a fervent "Amen."

These little spheres are peopled by ex-inhabitants of the earth, who got tired of their long journey and desired to tarry on the way.

Mr. Tinker recognized some faces in passing, but as he was on a through express train he could not stop to exchange greetings.

The day was spent in a patriotic manner, many eloquent addresses being made by former statesmen and warriors and soul-inspiring melodies filled the air from all sides.

Truly, it was a never-to-be-forgotten day and even the oldest inhabitant of this delightful place, Methusaleh by name, voted it to be a red letter day in the history of the planet Mars.

Chicago Western Union.

A visit to a few of the branch offices showed a condition of affairs at each office which emphasized the good work done by the company during the past year. Pleasant and courteous managers were in attendance, full of business, but looking for more.

District Commercial Superintendent Herbert Brown is to be congratulated on his selection of lieutenants, and we are glad to mention the names of a few of the men and women filling branch office positions whom we met on our visit: A. P. Harrison, manager and J. E. Petrbok, operator, "GB" office in the Peoples Gas Building, Michigan Boulevard; Wm. Levin, manager "NS" office 545 West Van Buren Street; F. L. Hoover, manager "HR" office, Hearst Building; J. M. Cerney, manager "DX" office, 300 South Halsted Street; Chas. Griebenow, manager "B" office, 173 West Washington Street; Geo. E. Hawkins, manager "D" office, 144 North Dearborn Street; A. Rashinski, manager "CK" office, 1527 West Madison Street; Arnold Keller, manager "MG" office, 188 West Lake Street; L. M. Hettel, manager "OS" office, 221 West Jackson Boulevard; Margaret Toohey, manager "A" office, Auditorium Hotel; Miss Kessler, manager "MO" office, Monadnock Building; Miss M. J. White, manager, and Miss M. A. Corrin, operator "WH" office, Dearborn Station; Edward Olson, manager "MA" office, Mallers Building; Miss A. Apperson, manager "MC" office, McCormick Building; G. W. Byington, manager "MQ" office, Adams Express Building; B. F. Stone, manager "PH" office, Palmer House; C. P. Hoffman, manager "RB" office, Railway Exchange; Miss E. C. Shaefer, manager "MB" office, Manhattan Building; A. C. Long, manager "BX" office, 223 North State Street; Miss A. Bagshaw, manager "NX" office, Congress Hotel, as well as District Commercial Managers J. B. Rankin, F. W. Ford and G. T. Richardson.

A master mind has Evan T. Jones, chief operator of the Chicago main office and his grasp on the conditions, and his knowledge of the requirements of this big equipment enable him to cope with any emergency which may arise. Most any person can go along treading a well beaten pathway, but it is when the unexpected happens that a man's genius shines, and his ready enterprising spirit finds a solution for the most difficult problem, even to an avalanche of unlooked-for business, which now frequently obtains. Mr. Jones is very observing and searching, but, withal, is exceedingly quiet. He knows exactly the qualification of every man on his staff, which fact serves well in properly placing his force during the present strenuous period. The company is always in need of men like Mr. Jones for higher positions.

R. G. Matthews, in charge of the quad room for several years, has been appointed assistant night chief operator, vice E. F. Wach, resigned. Mr. Wach is an architect, and resigned in order to devote his entire time to the duties of his profession.

B. P. Howard of Amarillo, Tex., has been added to the multiplex force.

District Traffic Supervisor H. F. Dodge is constantly thinking up something new to make conditions in the operating room more pleasant. Realizing the exhilarating influence of music on the human mind and its power to relax over-taxed nerves, he has caused to be placed in the ladies' rest room a fine Victrola, together with fifty choice records and from the way the phonograph is kept busy it is evident the innovation is warmly welcomed by the ladies. A convenient receptacle has been provided and the ladies are invited to designate on a card their choice of new music and a selection will be made from the cards when new records are to be purchased. Already the matron notices more animation and sprightliness among the ladies who visit the rest room and the good work goes marching on.

We are indebted to Miss Minnie Thompson, timekeeper, for many courtesies extended.

Miss Josephine Fletcher, formerly of the main office, and who has been working a private wire, has been sick in the hospital for some time, and would like to know of the whereabouts of a brother, also an operator, named John Fletcher. Address any information to Mrs. Victor Faulkner, Eighth Floor Western Union Building.

W. R. Drummond, chief bookkeeper of this office, has been appointed division auditor of the Mountain Division, with headquarters at Denver, Col. Mr. Drummond is well qualified for the position, having been at different times cashier at Evansville, Ind., traveling auditor at Chicago, and was made chief bookkeeper in December, 1913. From this position he is now advanced to that of division auditor, as stated. He is an untiring worker—energetic and resourceful—and commands the support and cooperation of all those under him.

Chicago Postal.

The Postal Telegraph Bowling League has just completed its schedule. Team No. 5 of the operating department carried off first honors by winning sixty-two and losing only twenty-two games of a total of eighty-four. Not only did they win the team prize but three of their members won individual prizes, C. Reblin carrying off the capital prize of $10.00 for the highest average number of pins per game. His total number for seventy-six games was 13,065 pins or an average of 171 69-76 pins per game. Hank O'Day was second with 12,955 pins for seventy-eight games or an average of 166 7-78 pins per game. J. Cady was fourth with 12,448 pins for eighty-one games or an average of 153 55-81 pins per game. The prize list shows a number of others were also lucky, and those who were less fortunate say "look out for our smoke and speed next year—those who are on top now will be among the 'has beens' when we get through with them."

Messrs. John Nering and Thomas Nl Powers, manager and chief operator, respectively, who recently visited Gotham, extended their trip to Philadelphia, Washington, and other points.

In my early life I was taught to adopt a system and then follow it out mechanically, and it was a good idea. The Chicago management seems to have imbibed this principle on a great scale as a visit to the operating room will demonstrate.

There is no clamor, no loud noises or shouting, and no apparent evidence of the vast amount of business handled by the company at this point. This state of efficiency has been brought about through the generalship of the managers in charge, coupled with the co-operation of all of its employes, and to no distinctive person is the credit for this state of things due. Much of the John W. Mackay spirit exists in this office and is manifested in the attitude of employes toward each other which courtesy extends to the telegraphing public.

Following is list of operators who have been employed and resigned during the past few weeks: Employed—Henry W. Spangenberg, Knute Hatlestad, J. T. Cassin, Louis R. Dalton, Carl M. Nelson, Thos. J. Noonan, Harold Hudson, Timothy Streckel, F. J. Reidel, J. Nicol, H. A. Slight, B. H. Erwin and F. J. Dailey.

Resigned—R. C. Fordy, Wm. S. Burke, F. G. Feeney, C. M. Nelson, Miss Iva Stewart, M. C. Denman, F. L. Flagg and H. H. Akers, the latter to join the United States Marines.

An Embryo Lineman.

Wm. Dee, now government superintendent of telegraph at Victoria, B. C., was the first manager for the Great North Western Telegraph Company at Victoria. This was many years ago, and Mr. Dee was joint operator and lineman and was expected to keep his "beat" in repair.

"Billy" was a good operator, but what he did not know about line work would fill an encyclopedia. One day the line went down, and after waiting an hour, young Dee provided himself with a team and buggy and started out to find and repair the trouble.

Seven miles up the country he discovered a spot where a tall pine had been blown down across the wire, bringing it down, together with a pole on each side. The tree was two feet in diameter and Dee sat down, like a general, to study out the best means of procedure. He figured out that his only way was to obtain an axe, chop the pole through just over the place it fell on the line, release the wire, set his poles and return home rejoicing.

He drove back three miles to a farm house where he borrowed an axe and returned to the scene of the break. Energetically he set to work to hew the tree. It was hard, very hard work and something he was not used to. His hands grew blistered and his axe became dull, but Billy labored on.

Presently the axe handle broke, the axe flew off hitting the wire, cutting it in two.

The wire being cut released itself from under the tree and Billy Dee stood there in open-mouthed wonder.

"Why didn't I think of cutting the wire and pulling it through instead of trying to saw this big timber in two? Well, I will know better the next time," said the embryo lineman as he speedily made his splice, set his poles and started for town.

As I remarked in the beginning, this occurred years ago and Mr. Dee has officiated at many another case of line trouble.

LETTERS FROM OUR AGENTS.

New York Postal.

Mrs. J. P. Williams, wife of all-night chief Williams, died May 4 at her home in Brooklyn, N. Y., after an illness of six weeks. She is survived by her husband and six children, including Mrs. A. W. E. Poinsette and James, Jr., a Rutgers student.

New York Western Union.

W. R. Taylor, assistant chief operator, is visiting Chicago for the purpose of acquainting himself with the method employed in maintaining the various statistical records in the Chicago office.

On April 25 a direct two-channel multiplex circuit was worked between New York and San Francisco with repeaters at Harrisburg, Pittsburgh, Toledo, Chicago, Omaha, Cheyenne, Ogden, Winnemucca and Sacramento. This installation handled an equated load of 176 messages per hour.

The eight-hour law went into effect in the operating room on May 1. The readjustment made necessary by the changed conditions was effected without the slightest inconvenience to traffic or confusion to individuals.

Miss Florence Preterre, one of our best lady operators, has been retired from active duty after many years' service. Miss Preterre is a fine linguist, speaking several languages fluently. She was formerly manager of the old St. Cloud Hotel, Forty-second Street and Broadway, New York. She later had charge of the Battery Park Hotel, Asheville, N. C. She will make her future home in Washington, D. C.

This department recently assisted the Washington office in the distribution of 30,000 "Liberty Loan" messages, addressed mainly to financial institutions.

Among the deaths of employes reported are those of Michael Dolan, an operator in the automatic department, and Frank S. Irvine, aged fifty-one years, an old-time operator attached to Commercial General Superintendent Nathan's office. Both men died on May 7.

Mr. E. H. Davis, who has covered considerable territory for the Western Union Telegraph Company throughout New York State and New England during the previous ten years and for the past year manager at Fitchburg, Mass., has been made manager at Lowell, Mass., in addition to his work in Fitchburg. This is a promotion for Mr. Davis and is warranted by his experience in the handling of large offices.

Boston Western Union.

The Western Union Association was organized recently by employes in the commercial, plant and traffic departments in Boston and vicinity for social purposes.

Mr. P. Walsh, manager of the Rockland, Me., office for forty-four years, has been retired on a pension.

Philadelphia Postal.

Telegraph business at Philadelphia continues very brisk for this season of the year and a number of new employes have been added to the operating department.

The annual meeting of the Mutual Investment Association of Philadelphia will be held on May 21. An excellent showing for the year has been made.

Special Postal wires were run to the University of Pennsylvania grounds to handle the telegraph file on the occasion of the recent visit to Philadelphia of Marshal Joffre and Premier M. Viviani of France.

The baseball team of the Philadelphia Postal Athletic Association has reorganized with Russell Keys, manager, W. G. Kurtz, captain. A successful season is expected.

Thos. B. Riley, manager of our Shenandoah, Pa., office and Francis P. McElroy of the American Telephone and Telegraph Company, were recent visitors.

Dallas Texas, Western Union.

Manager Gale of the Eagle Pass, Tex., office recently brought in a money transfer for $51,500. This was followed by one of $60,000 obtained by Manager Reid of the Brownsville office. Manager Leonard of the Laredo office recently had the bank opened on a holiday to receive a wagon load of gold, silver and currency amounting to $100,000.

St. Louis Western Union.

The employes of the main office subscribed ten cents each to purchase a large and beautiful American flag, and it is now suspended gracefully from the ceiling in the center of the operating room.

The dance and entertainment given by the Western Union Electrical Society, April 19, was well attended and a success. The programme consisted of songs and recitations by members, which were well rendered, after which there was an intermission for refreshments, followed by dancing.

On April 6, Miss Sophie Stone, clerk in the multiplex division, was married to Eli G. Frankel, recently of Los Angeles, Cal., and now employed as a reporter for the *St. Louis Republic*.

A two channel multiplex was installed to Atlanta, Ga., recently, and a one channel multiplex is being set up for use to Nashville, Tenn. Both are to supersede Barclay printers to those points.

Fairmont, W. Va., Western Union.

This company moved into its new office on April 24 and the event was celebrated in a rather unique and interesting manner. The first three messages out of the new office were sent by former operators living in the town. The first was sent by Captain K. D. Walker, over eighty years of age; the second, by Judge W. S. Hammond, and the third by Frank P. Hall, cashier of the Home Savings Bank. After this event the regular force, headed by Manager W. T. McWhorter took possession. The first two messages were of a congratulatory character between the Mayor of Fairmount, Manager McWhorter and A. C. Terry, district commercial superintendent at Pittsburgh, Pa.

Washington, D. C., Western Union.

Lou Klotz, who works the commercial news department stock wire, has been sick with rheumatism for seven weeks.

Jack Riley and Al. Kanode, both on the pension list, have reentered the service and are employed as doorkeepers here.

Instruction Reflected in Work

"Who did that job of wiring for you in your factory, Jones?" asked a business man. "It is the neatest piece of work I ever saw, and I have seen a good many examples of fine wiring."

"It was done by a graduate of the New York Electrical School," was the reply, "and I am proud of the work. Incidentally my opinion of the New York Electrical School is greatly enchanced. It produces very clever installers, operators and maintainers of electrical machinery, also fine draftamen. The reason it turns out such fine workmen is because the instruction is thoroughly practical and is individual. I believe these people have the right idea of instruction."

Further information about this School and its work may be obtained by addressing

The New York Electrical School
45 West 17th Street, New York City
Telephone Chelsea. 2633

Telegraph and Radio Operators, Electricians and Linemen, wanted for Signal Corps, U. S. Army. Pay ranges, according to rank and service, home or foreign, from $15 to $90 a month, and in addition rations, quarters, clothing and medical attendance are furnished. Signal Corps offers unusual opportunities for foreign service and rapid promotion to young men of character, intelligence and ability, who have had electrical training, particularly as telegraph or radio operators. For detailed information write to Chief Signal Officer, U. S. Army, Washington, D. C.

32d YEAR

Serial Building Loan and Savings Institution

President, - - Thos. W. Carroll
Vice-President, Thomas M. Brennan
Secretary - - Edwin F. Howell

Resources - - - - - $1,160,000
Reserve Fund - - - - $35,000

Business conducted under the Banking Law of New York

"No man spends exactly what he earns. He is either in debt or ahead of the game. Keep ahead by saving a little constantly and regularly. Begin now."

Western Union Building, 16 Dey Street, 9 a. m. to 5 p. m.
Postal Building, 253 Broadway, Room 1030, 2.30 to 4.30 p.m., Fridays, and each 15th and last day of month.
Telephone Building, 24 Walker Street. Room 1129. Daily 9 a. m. to 2 p. m.
Saturdays 1 p. m.

Rubber Telegraph Key Knobs.

No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fit snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. Address orders to TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York.

Telegraph and Telephone Age

No. 11. NEW YORK, JUNE 1, 1917. Thirty-fifth Year

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ANY NEWSDEALER in the United States or Canada can obtain copies of TELEGRAPH AND TELEPHONE AGE through the American News Company, New York.

BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, JUNE 1, 1917.

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What is Your Ideal?

Most persons have an ideal in life—some one thing or condition they wish to attain above all other things. An ideal, according to a dictionary definition, is "a standard of desire; an ultimate object or aim; a mental conception of what is most desirable."

If the question "What is your ideal?" be asked the average man, in all probability he would not be able to answer it offhand; he would have to think well before he could decide what his ideal in life is. Such a question will start him to thinking, which may lead him along lines of thought that he has never approached.

Ideals, of course, relate to good and desirable things. Men who have accomplished great things, and are lifting up the world and their fellow men by their achievements, are true idealists. They kept their ideal constantly in view and worked for its ultimate attainment. Work accomplished the result. Wishing for something and sitting down waiting for it to come, without working for it, will never yield results.

In the telegraph and telephone service ideals are numberless. One man's ideal may be to become a manager, a superintendent, an inventor, an organizer—in short, a leader of some sort. When he has decided what his ideal is he must plan a way to attain it. If you have no ideal, find one at once and work for its accomplishment. Men who have no ideal drift about in life with no directing influence. No one would ever think of sending a ship to sea without having some port of destination; she would never get anywhere in particular. Such men as Gladstone, Rockefeller, Schwab, Carnegie, Morse, Bell, and thousands of others, had ideals; their achievements were not the result of chance but of hard work. Why can't you do likewise and attain fame, just as these men have? They were no better prepared than you when they started out, but they had a definite purpose in view and they worked for its attainment. Any telegraph or telephone man can do the same thing providing he is sincere in his purpose, and unless he is surcharged with determination to win it will be useless for him to try to accomplish any results.

A Serious Situation For Newspapers.

The proposal to increase the rate for second-class mail, which is the newspaper mail, has created a whirlwind of opposition from newspaper publishers, and justly. Newspapers are, of course, willing to do their duty in helping to meet the extraordinary expenses of the government for war purposes, but to have an enormous increase in the postage rates added to their burden is more than the business will stand. One of the proposals is to establish a zone system of charges, which works out as an increase from 100 to 600 per cent. over the present postage rates. It is a serious situation for newspapers, and the entire publishing fraternity is united in opposition to the increase, which would have the effect of putting many papers out of business.

It would be nothing less than confiscation to place such a law into execution, and the very object the government is seeking to attain would be defeated. The papers are willing to do their patriotic duty, but if they are forced out of business by ill-advised legislation the government will lose that much support, and it needs all the support it can get at this time. Thomas Jefferson once said, "Were it left to me to decide whether we should have a without a government, I should not hesitate to prefer the latter." It is true that the privileges of the second-class mail are abused in many cases, but there is a way to remedy such abuses if the matter is approached in a spirit of fairness to all concerned.

The "Liberty Loan."

Telegraph and telephone men, officials and employes alike, who are all public spirited and patriotic, should become interested in the Liberty Loan of $2,000,000,000 which is now in process of negotiation by the government. Every operator should take a hand in the great work and help the government in this time of need. The denominations of the "bearer" bonds are $50, $100, $500 and $1,000, and the terms of payment are made easy so that all can take at least one bond without feeling that the payment therefore will be burdensome. This is a splendid opportunity to invest money at 3½ per cent. interest, which is what many savings banks pay on deposits.

Any bank or brokerage house will receive subscriptions. The bonds are exempt from all taxation, excepting estate and inheritance taxes, and investment in this class of securities is an excellent means of encouraging and practicing thrift. Telegraph and telephone employes are rapidly learning the lesson of economy and thrift and by investing in these bonds they will be laying up treasure that will yield them liberal returns in the future.

The Western Union and the Postal Telegraph-Cable companies have announced that they will assist their employes to purchase Liberty bonds on easy payments, and the telephone companies will recommend that their employes show their patriotism by purchasing bonds.

As to Intoxicating Liquor Advertisements.

On and after July 1 next it will be illegal to mail any publication advertising intoxicating liquors to any one in the United States or territory of the United States. Fine and imprisonment are the penalties provided for violation of this law. Telegraph and Telephone Age has never been guilty of carrying advertisements of this nature, so jail and imprisonment do not stare us in the face. But in these days of violent outbreaks in the Post Office Department it is not safe to predict what may happen before the war is over.

Telegraph and Telephone Patents.

ISSUED APRIL 24.

1,223,562. Telephone Arm-Rest. To M. Clemence, Kansas City, Mo.

1,223,937. Telephone System. To H. P. Clausen, New York.

ISSUED MAY 1.

1,224,161. Telephone Exchange System. To C. L. Goodrum, New York.

1,224,185. Telephone Signal and Recorder. To F. J. McGowen and K. W. Thalhammer, Los Angeles, Cal.

1,224,187. Telegraphic Transmitter. To H. J. Mahoney, Green Bay, Wis.

1,224,324. Telephone Bracket. To H. B. Roberts, Highland Park, Ill.

1,224,342. Multiplex Telegraphy. To F. K. Vreeland, New York.

1,224,343. Wireless Telegraphy. To J. O. Watkins, San Francisco, Cal.

1,224,374. Two Way, Two Wire Trunk for Multi-office Automatic Exchange System. To C. L. Goodrum, New York.

1,224,425. Telephone System. To Le R. W. Stanton, Davenport, Iowa.

1,224,499. Radio Telegraphy and Telephony Receiver. To G. W. Pickard, Boston, Mass.

1,224,640. Telegraph System. To R. Hitchcock, New York.

1,224,883. Telephone Supervisory System. To C. Mollerup, Chicago, Ill.

ISSUED MAY 8.

1,224,922. Mouthpiece for Telephone Instruments. To C. M. Hartnett, Chicago, Ill.

1,224,956. Telegraph Transmitter. To E. H. Piersen, Topeka, Kan.

1,225,136. Sound-Intensifying Device for Telephones. To H. J. Kastner, Dayton, Mich.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on May 26:

American Tel. and Tel. Co.	122⅞
Mackay Companies	84-85
Mackay Companies, pfd.	65-66
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2⅝
Western Union	92⅝

PERSONAL.

Mr. Thomas Ahearn, of Ottawa, Ont., one of the best-known old-time Canadian telegraphers, was a New York visitor last week. He made the trip in his automobile.

Mr. Richard Spillane, the well known old time telegrapher, is managing editor of *Daily Financial America* of New York, one of the leading financial papers of the country.

Mr. J. G. Case, of Kirkville, N. Y., formerly secretary and treasurer of the Bankers and Merchant's Telegraph Company, was in New York a few days ago and visited many of his old telegraph friends.

Mr. F. V. Moffitt, formerly manager of the Toledo, Ohio, office of the Western Union Telegraph Company, who retired from active service two years ago is now engaged in the insurance and real estate business at Cedar Rapids, Iowa.

Mr. J. G. Van Kuyk, subdirector of the Netherlands East Indian Government Telegraph Company, Batavia, Java, who has been in this country for some time making purchases for his department, sailed from San Francisco for home a few days ago.

Mr. Thomas A. Edison formally opened the National Music Show in Chicago on the night of May 19 by sending a message himself from the Orange, N. J., Western Union office to the manager of the show. Mr. E. B. Davis, manager of the government without newspapers, or newspapers

Orange, N. J., Western Union office to the managers Mr. Edison said he would send it himself, and he did so with his old time skill.

Mr. H. A. Tuttle, president and general manager of the North American Telegraph Company, Minneapolis, Minn., who recently returned from a business trip, according to newspaper reports, is very optimistic at the future outlook in the sections visited by him. Fargo, N. D., was particularly pleased with the favorable criticism of Mr. Tuttle over the apparent enterprise and prospects of that thriving and rapidly developing city.

Stuck to His Post.— Mr. John C. O'Reilly, manager of the United District Messenger Company's office in the basement of the City Hall in New York, was the only person who stuck to his post during the recent fire which destroyed the tower of that building. All left the building but Mr. O'Reilly, and he remained on duty with water pouring down on him and the place was filled with smoke. His business, however, did not suffer in any way. Mr. O'Reilly is known to almost every city official and is respected by all.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. Edward Reynolds, vice-president and general manager, made a business trip to Philadelphia, Baltimore and Washington last week.

Major Charles P. Bruch, vice-president of this company, has received a very handsome pair of binoculars, attached to which is a silver plate engraved as follows: "Major Charles P. Bruch. Presented by the Ohio Society of New York, May, 1917." Binoculars are a part of an officer's equipment required by the Army regulations. This presentation was made by the Ohio Society as an expression of appreciation of Mr. Bruch's services as its president, and of congratulations upon his appointment by President Wilson as a major in the Signal Section of the Army of the United States.

Mr. W. I. Capen, vice-president, New York, has returned from a trip of inspection through the middle west.

Mr. C. F. Leonard, superintendent, New York, made an inspection through the coal regions of Pennsylvania last week.

Mr. J. P. O'Donohue, division electrical engineer, New York, is on a business trip through the Eastern Division.

Mr. E. Clyde Cooksey, manager of the Roanoke, Va., office and Commissioner of Parks of that city, was a New York visitor last week. He had a conference with the Park Commissioner of New York to obtain the latest wrinkles in the management of public parks for the benefit of the community in which he is a prominent citizen.

Mrs. Annie M. Ribble, wife of Mr. G. W. Ribble, general superintendent, Southern Division, Atlanta, Ga., died on April 30, at the country residence of her sister near Lynchburg, Va. Mrs. Ribble had been in poor health for some years, but there was nothing alarming in her condition until shortly before the end. She had accompanied Mr. Ribble as far as Virginia, for a visit, while he made a business trip, from which he was recalled by her illness. She was fifty-one years of age, a daughter of the late Captain B. G. Patterson, a prominent Virginia lawyer and member of the legislature. She is survived by two children, Miss Virginia and Keith P. Ribble, besides her husband. Interment was at West View Cemetery at Atlanta.

Managers Appointed.—A. L. Cobb has been appointed manager of the Mackay Telegraph-Cable Company's office at Hot Springs, Ark. Appointments in the Postal service are, Miss Pauline Smith at La Fayette, Ga.; Miss Emily Langenberg, Holland, Mich; W. A. Boyer, Paducah, Ky.; F. James, Hannibal, Mo.; Clyde Gorman, Newport, Tenn.; J. L. Matthews, Erie, Pa. vice L. J. Mackey, resigned. Mr. Matthews was manager at Altoona, Pa., for many years. He is succeeded at Altoona by Stewart E. Knapp.

Mr. Charles A. Johnson, manager of the Meadville, Pa., office, has been elected president and a director of the Playground Association of that city. This association is doing excellent work for the children of Meadville.

Liberty Bonds for Employes.—The Mutual Investment Credit Union of the employes of this company offers its good offices to any one in the Postal service who may wish to subscribe for Liberty Loan bonds without any compensation to itself. To those who may wish to subscribe for these bonds, to be paid for on the instalment plan, the Credit Union will accept their subscriptions to be be paid for in instalments of $5.00 per month, or more. It is expected that the $50.00 or "Baby Bond" will be very popular with the employes.

Complimentary Dinner to Mr. A. B. Richards.

Mr. A. B. Richards, who was recently promoted from the position of district superintendent of the Postal Telegraph-Cable Company at Kansas City, Mo., to be general superintendent of the Pacific Division of the same interests, with headquarters at San Francisco, "was shown" the extent of his popularity by former associates on the evening of May 7 before his departure for his new field of endeavor.

About sixty employes of the fifth district were present, among whom were Manager Paul Rankin, Oklahoma City; W. L. Meeks, Wichita; Rod Smith, St. Joseph; Fred Hammontree, Independence; E. W. Porter, Lawrence, and W. L. Simpson, of Chicago, and Mr. Richards' successor, Mr. S. H. Mudge.

After the tables had been cleared and cigars and candy passed around, Manager B. F. Rommell introduced W. L. Moore, who had been associated with Mr. Richards for thirty years, and who told in his characteristic manner of a number of incidents which had occurred during this time. He was followed by Chief Operator T. W. Ingram, General Foreman T. W. Curphey, Assistant Manager

H. C. Hill, Cashier W. C. Morche, and Wire Chief B. W. Fields, all of whom have been in the Kansas City office under Mr. Richards for more than twenty years.

Mr. Rommell next called upon Mr. Charles Falk, night chief operator, and Miss Hulda Erker, for some music, and in doing so referred to Mr. Falk as not having been tardy to his work once in twenty-seven years. Mr. Falk on the zither and Miss Erker on the violin rendered several very pleasing selections during the evening.

Mr. Rommell read telegrams from Vice-President and General Manager Edward Reynolds, Vice-President W. I. Capen, Electrical Engineer M. M. Davis, of New York; General Superintendent E. W. Collins, Division Electrical Engineer H. C. Shaw, and General Superintendent of Plant C. M. Baker, Chicago; Superintendent W. C. Black of Denver; Manager W. W. Morrison of St. Louis, and several others out of over 200 which were received during the evening.

Speeches were made by Managers Meeks, Smith, Rankin and Hammontree, followed by little talks by a number of others. Mr. Meeks in his remarks referred to the fact that the fifth district had already furnished the Postal one vice-president, Mr. W. I. Capen, and two general superintendents, Messrs. G. E. Paine and A. B. Richards, and was prepared to furnish still more of them.

At the conclusion of the speech making, Manager Rommell, who has served with Mr. Richards for thirty years, presented him with a small token of remembrance from the employes of the district, and in so doing eulogized Mr. Richards in a most touching manner. Before he was through speaking most of his audience was in tears, and when the time came Mr. Richards was almost too overcome to reply. Superintendent Mudge, too, was most deeply affected by the show of affection for Mr. Richards, and also for the unanimous offers of support of the entire assemblage, and confessed his inability to make a speech. After a few words he and Mr. Richards drank a toast to each other's success, thus ending an enjoyable evening.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

PRESIDENT NEWCOMB CARLTON announces that Liberty bonds will be offered employes of the company on easy terms of payment. Bonds in amount equal to 25 per cent. of the employe's annual salary will be offered, to be paid for in 18 instalments.

MR. W. N. FASHBAUGH, vice-president in charge of traffic, is taking an active interest in stimulating the sale of Liberty Loan Bonds among the employes of the company. He states that the $50.00 bond is the most desirable to purchase in small lots. In his opinion this bond ought to pass as freely as a $50.00 bill, and there is no reason why it should not, as it has the resources of the government back of it as well as accruing interest. Bonds of this denomination are in the "bearer" class. The lowest denomination of registered bonds is $100.

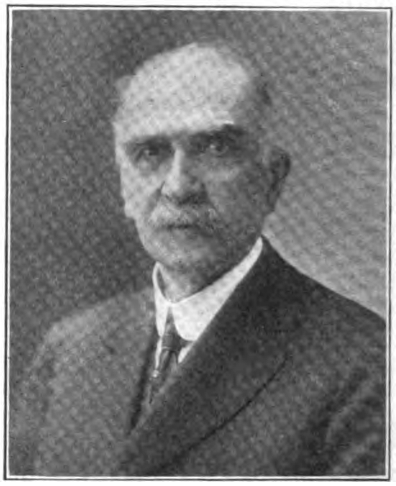
MR. T. A. WORTHINGTON, formerly manager at Newport News, Va., for the past year manager of the Petersburg, Va., office, has returned to Newport News, where he again assumes the management of the company's affairs at that point.

MR. W. L. ADAMSON, manager of this company's office at Vincennes, Ind., has been advanced to the management of the Bloomington, Ill., office.

Retirement of Frank D. Giles.

Mr. Frank D. Giles, the well known telegrapher of New York, who has been a member of the Western Union Benefit Committee since its inception and until recently chairman of the Committee, has resigned that position owing to ill-health and is starting with his wife on an automobile tour to Los Angeles, Cal., where the family of Mrs. Giles resides.

Mr. Giles is one of the best known members of the telegraphic fraternity. He was born near Ovid, Seneca County, N. Y., July 2, 1849. He entered the telegraph service in 1864 and was an operator in the Chicago office in 1866, and manager of the Pacific and Atlantic Telegraph Company at the same point at the time of the great fire in 1871. Mr. Giles was manager of the Ogden, Utah, office from 1872 until 1881, when he was made manager of the Salt Lake office which position he held until 1885. In that year he came to New York, where he has occupied important positions in the Western Union service since that time. In 1910 Mr. Giles was transferred from the general operating department to the office of the general manager of the Eastern Division in the capacity of special agent.



FRANK D. GILES.

Mr. Giles is well known to the older members of the fraternity in the West and his friends in all sections of the country unite in the hope that his trip to the Pacific Coast, which will occupy at least three months, will prove beneficial to his health, which has not been the best of late.

HERMAN LINCOLN WATERBURY, aged seventy-two years, manager of the Western Union office at Saratoga Springs, N. Y., for the past thirty-four years, died at that place on May 13. He was a native of Saratoga Springs and his entire telegraph career was spent at that point and vicinity. He was chief operator for the United States Telegraph Company in Albany, N. Y., in 1864, and when that company and the Western Union Telegraph Company was consolidated he continued with the latter.

Mrs. Marietta T. Gulick, wife of C. W. Gulick, of White River Junction, Vt., formerly superintendent of construction of the Western Union Telegraph Company in New England, died at her home April 29. She is survived by her husband, an old-time and military telegrapher, who retired from active business some years ago, and by two daughters. Mr. Gulick will make St. Paul, Minn., his place of residence hereafter.

THE CABLE.

The Multiplex Installation between New York and the cable station at Hearts Content, N. F., has been completed, and is in good working order, although as yet not in regular service.

Havana Cable Repaired.—The cable of the Commercial Cable Company of Cuba, connecting New York and Havana, which has been broken since April 19, has been repaired and is now in working order.

Mr. T. F. Foley, superintendent of the cable station at Hamill, L. I., has gone to Hearts Content, where he will be connected with Mr. Heurtley in installing cable magnifiers, which devices are designed to increase the speed of trans-Atlantic cables.

Cablegrams to Cuba.—Cablegrams to Havana City may be in any one of the codes authorized by the United States Censorship. Cablegrams to other places in Cuba may be in the following codes: A. B. C., fifth edition; Scott's, tenth edition; Western Union, Lieber's, and Bentley's. Five-letter editions are not admitted. Messages must be written in plain language, English, French or Spanish.

Morse Code on Ocean Cables.—The United Telegraph and Cable Company of Springfield, Ohio, has been authorized to increase its capital stock from $3,000 to $100,000. Mr. William M. Bruce, president of the company announces that he has practically perfected an appliance by which the Morse Code can be used on trans-oceanic cables. The company has closed a contract with the Commercial Pacific Cable Company for equipment for the cable from San Francisco, Cal., to Shanghai, China.

Mr. Bruce's work consists of a method for the employment of Morse equipment (key and sounder) on submarine cables, on which apparatus he has been granted several patents. His patents also cover a new and improved relay for cable work, which can be used not only for the Morse but for the regular recorder type of signals as well. Actual tests have proved this instrument to be very efficient. The relay, it is stated, is fast and easy to maintain, as is, besides accurate in operation.

Mr. Bruce has operated direct from London to New York by his system and direct communication between Canso, N. S., and New York is now in regular service, the operator at New York receiving the signals direct from the sounder. This line includes a stretch of cable between Canso, N. S., and Rockport, Mass., on which the siphon recorder system has been employed hitherto.

Mr. Bruce is a telephone engineer and was recently chief engineer and general superintendent of the American Automatic Telephone Co.

Thomas Gemmill, aged fifty-three years manager of the Central and South American Telegraph Company's office at Coatzacoalcos, Mexico, died in that place May 15. Mr. Gemmill was born in Scotland in March, 1864, and entered the service of the Central and South American Telegraph Company in March, 1886. He was appointed manager of Coatzacoalcos, Mexico, station in 1890, and was also appointed land line superintendent for the Isthmus of Tehuantepec in 1909. He was also British Consul at Coatzacoalcos. Mr. Gemmill was a faithful, loyal employe and a genial companion. He is survived by his wife and family, who are living in Dumfries, Scotland.

Cable Interruptions.

Interruption to submarine telegraph cables are reported to May 26, as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable) October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917; Martinique-Paramaribo, April 10, 1917.

CANADIAN NOTES.

CANADIAN PACIFIC.

Mr. C. L. Leighty, heretofore inspector of transportation for Eastern Lines, Canadian Pacific Railway, with headquarters at Montreal, Que., has been appointed superintendent of Canadian Pacific Telegraphs, Ontario Division, with headquarters at Toronto, Ont., vice Mr. H. J. Lillie, who has been appointed circuit manager of the Ontario Division, and also in control of the Toronto office, with headquarters at Toronto. Mr. H. Bott, chief operator, Toronto, has been appointed inspector and assigned to other work.

GREAT NORTH WESTERN.

Mr. J. R. Rochon, has been appointed manager at Fort William, Ont., vice Mr. W. F. Cady, who has accepted a position with the grain firm of Davidson & Smith at Fort William. Mr. Rochon has been night operator at the Port Arthur office for the past two years.

Employes of this company, at Winnipeg, representing all departments, held a meeting on April 27, for the purpose of organizing an athletic club. The following officers were elected: Geo. D. Perry, honorary patron; J. G. Davies, honorary president; F. W. Lee, president; J. Lennox, vice-president; G. Wainwright, secretary-treasurer. Executive committee: Miss Lennox, Miss Auld, Miss Hanson, Miss Nicholson, Mr. McDougall, Mr. Lee, Mr. Campbell, Mr. Wainwright, Mr. Cadle, Mr. Gottfred.

Canadian Press Association.—At the annual meeting of the Canadian Press, Ltd., which will be held in Toronto, June 12, the members will be asked to ratify proposals to make the body a truly national one. The Canadian Press, Ltd., although controlling the franchise rights, has not operated the news service itself but has left this duty to various sectional associations in the Dominion. It is now proposed to weld the isolated efforts of these associations into a single responsible and powerful national association. Leased wires will be operated day and night from the Atlantic to the Pacific.

Telegraph Business in Canada.—The earnings of the cable, telegraph, and wireless companies and the Government telegraph service of Canada, taken in aggregate, are reported by the *Monetary Times* of Canada, to have been larger in 1916 than in any other year since the compilation of statistics on the subject was begun. The statistics cover the operations of nine companies, the Dominion Government telegraph service, the Temiskaming and Northern Ontario Railway Company lines, and the Pacific Cable, which is the property of the British Government and the governments of the various Dominions which it serves. Gross earnings in 1916 reached $6,255,740, as compared with $5,536,337 in 1915. Net operating revenue is given at $2,538,924, and net income, after payment of taxes, interest on bonded indebtedness, etc., at $2,282,529. The pole mileage of telegraph lines in Canada in 1916 was 40,251, and the wire mileage 206,551. In 1916 there were 10,835,936 land messages and 1,134,905 cablegrams transmitted, as compared with 9,952,134 land messages and 977,389 cable messages in 1915.

THE TELEPHONE.

Liberty Loan Bonds.—The American Telephone and Telegraph Company has subscribed for $5,000,000 worth of Liberty Loan bonds.

John P. Vollmer, aged seventy-one years, a member of the Telephone Pioneers of America, died at his home in Lewiston, Idaho, May 7. He built the first telegraph line in Idaho in 1876. He also built and operated the first Bell telephone line on the Pacific Coast in 1878. At the time of his death he was in the banking business.

The Southern States Independent Telephone Association held its annual convention at the Louisville Hotel, Louisville, Ky., May 24, 25 and 26. Among the papers read were "The Relation of the Interstate Commerce Commission to Telephony," by Hon. Joseph W. Folk, chief counsel for the Interstate Commerce Commission, Washington, D. C.; "Wood Preservatives," by K. C. Barton, Chicago; "Advertising Methods," by E. I. Pratt, Chicago.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager, Marconi Wireless Telegraph Company of America, New York, has issued a circular letter to the company's employes stating that employes whom the company considers essential to its organization in serving the government are exempt from conscription, but not from service. He therefore expresses the hope that every member of the staff will feel it his duty to remain at his task in order to keep the organization intact and equipped for service.

David Sarnoff, commercial manager, New York, is en route to the Pacific Coast on an extended trip, making stops at Cleveland, Chicago, Seattle, San Francisco and other points. He will be absent about six weeks.

E. A. Nicholas has been appointed acting superintendent at Cleveland, vice A. E. Jackson, who has been called to the colors.

Date of Radio Meeting Changed.—The date of the meeting of the Institute of Radio Engineers, which was to have taken place Wednesday evening, June 6, has been changed to June 7. Prof. M. I. Pupin, president of the Institute, will then present his paper on "Iron at Radio Frequencies."

Against the Suppression of Amateur Wireless Operators.—Dr. A. E. Kennelly, professor of electrical engineering at Harvard University and the Massachusetts Institute of Technology, Boston, appeared recently before a committee of the House of Representatives at Washington and made a strong argument against the injudicious suppression of amateur radio stations. He believes that amateurs will solve many of the problems involved in practical radio operation and should not be suppressed.

Wireless on Spanish Vessels. — All Spanish merchant vessels of 500 tons or over, devoted to the ocean or coastwise trade, are to be provided with wireless telegraph apparatus with a minimum range of 100 miles.

Radiotelegraphy.—There is a great demand for an authoritative book on radiotelegraphy on account of importance of that system of communication at this time. The best book on the practice of wireless communication is "Radiotelegraphy," issued by Brigadier-General George P. Scrivens, formerly chief signal officer of the United States Army, for use in the United States Signal Corps. This work is extremely practical, it is needless to say, and when it has been mastered by the student he is well grounded in the practice of the art. It is one of the clearest descriptions of wireless that can be had, and excellent original drawings greatly add to the complete understanding of the text. It has 135 pages and 85 illustrations, and is bound in paper. Every practical wireless man and wireless student should have a copy of this book at hand for immediate reference. The clearness of the language used is a great feature of the book. The price is 60 cents per copy. For sale by Telegraph and Telephone Age, J. B. Taltavall, publisher, 253 Broadway, New York.

Mr. J. P. Stith of the Western Union Telegraph Company, Richmond, Va., writes: "You say the price of paper is up; just so and the only thing that I know of that hasn't gone up in price is the holes in doughnuts. In fact they are making them larger (the holes I mean) for the same old price. Subscriptions may be slow but you can't blame the fellows for eating first."

Stand Behind the Men Behind the Guns.

BY W. G. McADOO, SECRETARY OF THE TREASURY, WASHINGTON, D. C.

"Buy a Liberty Loan bond and help win the war. Issued by the United States Government in denominations of $50, $100, $500, $1,000, $5,000, $10,000, $50,000 and $100,000. Interest 3½ per cent. First payment as low as one dollar. You have until August 30, 1917, to pay in full for your bonds. Ask any banker, postmaster, express company or merchant for an official application blank and apply for your Liberty Loan bond today. A tribute to the flag and the safest investment in the world.

"Wars cannot be conducted without money. It is the first thing to be provided. In this war it is the most immediate help—the most effective help that we can give. We must not be content with a subscription of two billion dollars—we must oversubscribe this loan as an indication that America is stirred to the depths and aroused to the summit of her greatness in the cause of freedom. Let us not endanger success by complacent optimism. Let us not satisfy ourselves with the reflection that some one else will subscribe the required amount. Let every man and woman in the land make it his or her business to subscribe to the Liberty Loan immediately, and if they cannot subscribe themselves, let them induce somebody else to subscribe. Provide the government with the funds indispensably needed for the conduct of the war and give notice to the enemies of the United States that we have billions to sacrifice in the cause of liberty.

"Buy a Liberty Bond today; do not put it off until tomorrow. Every dollar provided quickly and expended wisely will shorten the war and save human life."

A Plea for Better Spelling.

BY R. S. DIXON, MANAGER STOCK YARDS BRANCH OFFICE, POSTAL TELEGRAPH-CABLE COMPANY, KANSAS CITY, MO.

As many of the telegraph officials and operators of the country read your magazine I thought it would not be a bad idea to refer to a matter that has been brought very forcibly to my notice, on all classes of circuits, from the bonus wires to the woods. It is this: A large number of operators are very poor spellers, and a good speller will, in the course of a month, correct many errors in orthography while receiving, never telling the sending operator that a word has been misspelled.

Now the greatest fact in this connection is that many of the men with whom I have worked and who proved the worst offenders were men that had come from the ranks of messengers. It seems to me that officials of all companies could render a great service by impressing upon students in telegraphy the importance of spelling properly, and at the same time they would be fulfilling the truth of the slogan "Accuracy First." It might be argued that a receiving operator should follow the sender, but this is very difficult to do on a fast wire.

This lack of ability to spell properly has resulted in many cases in keeping otherwise desirable operators out of the service of press associations, and it is not an infrequent occurrence on a wire for poor spellers to receive a "roasting" by their co-workers. Spelling is certainly an all-important acquirement, principally for the reason that errors of this kind reach the hands of customers who are generally critical in such matters. A message with the words properly spelled makes a favorable impression upon the person to whom it is addressed, and one with poor spelling naturally has the opposite effect.

In my regular work as manager of a large branch office I find it necessary frequently to correct errors of spelling. These errors are not all chargeable to the telegraph either. The writers of the messages themselves are frequent offenders, but it is a great satisfaction to one who has "Accuracy First" at heart to be able to do his "bit" toward perfection in the telegraph service.

The Death of George W. Conkling.

The news of the death of George W. Conkling, the champion telegrapher, has caused universal regret in the telegraph fraternity. The loss to the profession of one so highly talented as was the deceased will not be forgotten for a long time. Fortunately his beautiful Morse has been preserved for the admiration of the telegraphic world through records for the phonograph. This, we believe, is the first time where the work of a famous telegrapher has been preserved for the instruction and entertainment of future generations.

Mr. Andrew S. Weir, the well-known telegrapher, of Philadelphia, expresses deep regret at the death of Mr. Conkling. "Mr. Conkling," he says, "was particularly liked by the members of the executive committee of the tournament held in Philadelphia [in 1903], as he did so much to aid us in our work. Being closely identified with the several fraternities in Philadelphia, I feel that I have the authority to say that we Philadelphians mourn the loss of so valuable a man and friend as George W. Conkling."

Telegraphs and Telephones in China.

The first telegraph system in China was introduced in 1882, under the direction of a Danish expert; the private telegraph business was nationalized in 1908, and now the entire service is controlled by the Ministry of Communications. At the close of 1913 telegraph lines extended over 37,403 miles, with 51,129 miles of wire. Submarine cables, with the exception of the Woosung-Canton line opened in the early part of 1915, are all under foreign control. The telephone service, inaugurated in 1903, consists of government (both central and provincial) and private undertakings. The control of both telegraph and telephone systems is practically in the hands of foreigners, from the circumstance that these systems were constructed by the aid of foreign capital.

DEFICIENCY IN ENGLISH TELEGRAPHS. — The English telegraph service during 1916 shows a deficiency of $2,500,000, notwithstanding an increase of rates of fifty per cent throughout Great Britain and Ireland.

J. Frank Howell, President Consolidated Stock Exchange.

At the recent annual election of the Consolidated Stock Exchange Mr. J. Frank Howell was elected president by an almost unanimous vote. Back of this election is one of the romances of business. Years ago, Mr. Howell went to the Consolidated Stock Exchange as an arbitrage telegrapher. Now he is chosen to hold the highest office in the gift of that body.

Mr. Howell is a Kentuckian by birth, but was raised in Illinois on a farm. He milked the cows, pitched hay, plodded along the furrows and, when there was nothing else to do, went to the station and saw the trains come in and depart. Somehow, he picked up telegraphy and in course of time got a position at the station. Incidental to his day's work as operator, he "smashed baggage," helped load and unload local freight and purveyed the news of the world as he got it over the wire, to the inhabitants. One day a gentleman who was short of cash and didn't know of any better way to get to Chicago than to have the young man in the station trust him for the price of a ticket to the city by the shore of Lake Michigan, asked the youth to sell a ticket to him "on tick." Howell did so. Many years later the two met again. Then the telegrapher was a broker of some prominence in New York and the other was one of America's most famous writers. The man who was trusted was Elbert Hubbard, and he devoted a goodly portion of one issue of *The Philistine* to a tribute to the youth who had faith in men long ago and never has changed in that respect.

Mr. Howell, next to Thomas A. Edison, probably is the most widely known of men to American telegraphers. He never has lost his love for dots and dashes and has a wire in his private office which is looped on to one of the wires he leases for the transaction of his brokerage business.

He did not come to New York until he had seen a good deal of the United States. Like most telegraphers and printers of a generation ago, he had the wanderlust in his youth. From Morrisonville, Ill., where he had his first position, he went traveling over the country. Telegraphers were scarce in those days and it was easy to get a pass if the traveler had any claim to the courtesy of the railroad. The fact that the applicant for free transportation had worked for a railroad or was a telegrapher was sufficient to warrant a conductor to be generous or for a division superintendent to issue a pass.

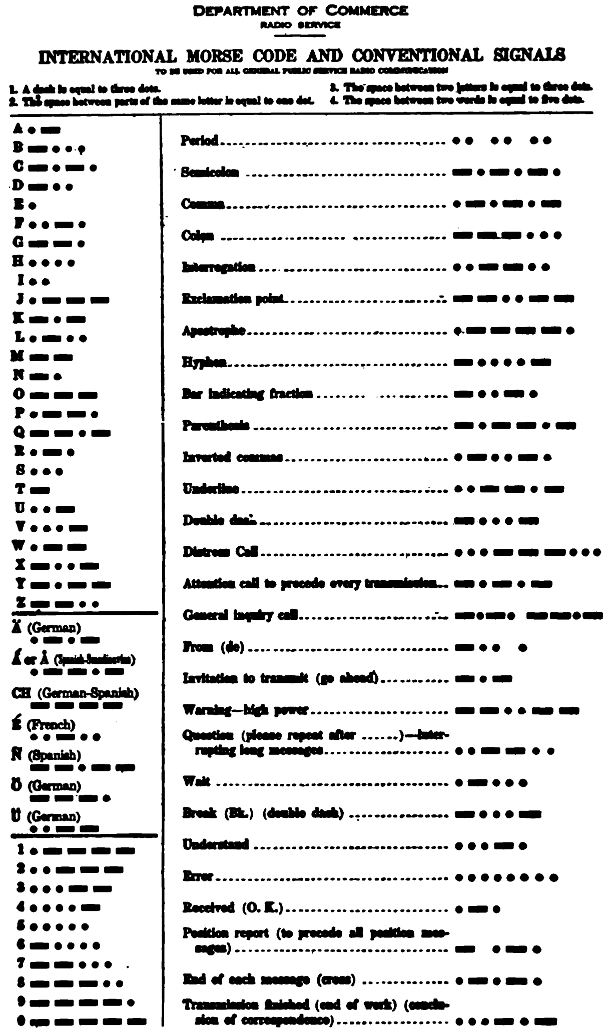
Carefree, adventurous and ever restless, young Howell went East, West, North and South for several years working for a while as night operator or day operator here or there, as dispatcher's operator occasionally and, as he got to be a crack operator, on one of the trunk wires of the Western Union.

In course of time he floated into New York still a youth but a much-traveled one. There is a comradarie of the wire and he was known from New York to 'Frisco and from the Gulf to Manitoba. He still is known for the old-timers tell of how he went to Wall Street and remained there and how from working a key down there, he has grown to be the head of a big brokerage house.

A few days ago, when the press association reports went over the wires telling of the election of Mr. Howell to the presidency of the Consolidated messages began to come in to him from telegraphers far and near. Nearly all of them were made up of only the figures "73" but in the language of the wire, "73" means everything in the way of good wishes, congratulations, fellowship. Mixed in with the messages from working telegraphers were others from men prominent in railroad affairs and various lines of industry who, like Mr. Howell, rose from the key.

International Morse Code.

The following chart is reproduced from one issued by the Department of Commerce, Radio Service, giving the international Morse code and conventional signs used in all general public service radio communication. This chart was published in our issue of November 1, 1914, and is again reproduced in answer to many inquiries for this code. (Another chart is published on page VII.)



DEPARTMENT OF COMMERCE
RADIO SERVICE

INTERNATIONAL MORSE CODE AND CONVENTIONAL SIGNALS
TO BE USED FOR ALL GENERAL PUBLIC SERVICE RADIO COMMUNICATION

1. A dash is equal to three dots.
2. The space between parts of the same letter is equal to one dot.
3. The space between two letters is equal to three dots.
4. The space between two words is equal to five dots.

A	● ▬
B	▬ ● ● ●
C	▬ ● ▬ ●
D	▬ ● ●
E	●
F	● ● ▬ ●
G	▬ ▬ ●
H	● ● ● ●
I	● ●
J	● ▬ ▬ ▬
K	▬ ● ▬
L	● ▬ ● ●
M	▬ ▬
N	▬ ●
O	▬ ▬ ▬
P	● ▬ ▬ ●
Q	▬ ▬ ● ▬
R	● ▬ ●
S	● ● ●
T	▬
U	● ● ▬
V	● ● ● ▬
W	● ▬ ▬
X	▬ ● ● ▬
Y	▬ ● ▬ ▬
Z	▬ ▬ ● ●
Ä (German)	● ▬ ● ▬
Á or Å (Spanish-Scandinavian)	● ▬ ▬ ● ▬
CH (German-Spanish)	▬ ▬ ▬ ▬
É (French)	● ● ▬ ● ●
Ñ (Spanish)	▬ ▬ ● ▬ ▬
Ö (German)	▬ ▬ ▬ ●
Ü (German)	● ● ▬ ▬
1	● ▬ ▬ ▬ ▬
2	● ● ▬ ▬ ▬
3	● ● ● ▬ ▬
4	● ● ● ● ▬
5	● ● ● ● ●
6	▬ ● ● ● ●
7	▬ ▬ ● ● ●
8	▬ ▬ ▬ ● ●
9	▬ ▬ ▬ ▬ ●
0	▬ ▬ ▬ ▬ ▬

Period	● ● ● ● ● ●
Semicolon	▬ ● ▬ ● ▬ ●
Comma	● ▬ ● ▬ ● ▬
Colon	▬ ▬ ▬ ● ● ●
Interrogation	● ● ▬ ▬ ● ●
Exclamation point	▬ ▬ ● ● ▬ ▬
Apostrophe	● ▬ ▬ ▬ ▬ ●
Hyphen	▬ ● ● ● ● ▬
Bar indicating fraction	▬ ● ● ▬ ●
Parenthesis	▬ ● ▬ ▬ ● ▬
Inverted commas	● ▬ ● ● ▬ ●
Underline	● ● ▬ ▬ ● ▬
Double dash	▬ ● ● ● ▬
Distress Call	● ● ● ▬ ▬ ▬ ● ● ●
Attention call to precede every transmission	▬ ● ▬ ● ▬
General inquiry call	▬ ● ▬ ● ▬ ▬ ● ▬
From (de)	▬ ● ● ●
Invitation to transmit (go ahead)	▬ ● ▬
Warning—high power	▬ ▬ ● ● ▬ ▬
Question (please repeat after ......)—interrupting long messages	● ● ▬ ▬ ● ●
Wait	● ▬ ● ● ●
Break (Bk.) (double dash)	▬ ● ● ● ▬
Understand	● ● ● ▬ ●
Error	● ● ● ● ● ● ● ●
Received (O. K.)	● ▬ ●
Position report (to precede all position messages)	▬ ● ▬ ●
End of each message (cross)	● ▬ ● ▬ ●
Transmission finished (end of work) (conclusion of correspondence)	● ● ● ▬ ● ▬

Mr. H. C. Jacobs, manager of the Postal Telegraph-Cable Company at Mt. Sterling, Ky., writes: "The AGE fills its purpose and keeps before us old time traditions that are too fast fading away."

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions following each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

ARRANGEMENT OF CELLS IN BATTERIES.

Cells in Multiple—When it is desired to obtain additional strength of current without increased electromotive force, the cells are connected as shown in Fig. 1, which represents two rows of six cells, each with the negative pole of each row joined at A, and the positive pole of each row joined at B. When thus arranged the two rows of cells are said to be in multiple, or parallel.

Thus arranged, each cell of each row adds its e. m. f. to that of its adjoining cell, so that each row has at its terminals a difference of potential of six volts, as in the case of separate row of six cells, Fig. 1, May 16. But, in the case of the cells in multiple, twice as much current will flow in the external circuit, W, as when the cells are connected in series. A cell or battery whose terminals are thus connected by a wire of practically no resistance is said to be "short circuited."

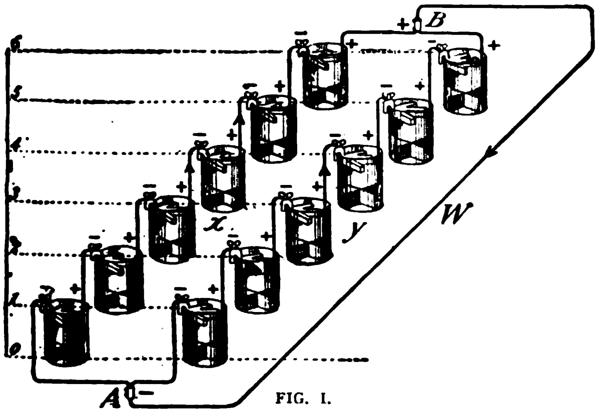


FIG. 1.

The doubling of the current in the case of Fig. 1 is due to the fact that the internal resistance of the cells has been reduced one-half, as will be shown in our next instalment.

(To be continued)

QUESTIONS IN TELEGRAPHY.

What is the effect of connecting cells in multiple?

Describe the multiple arrangement of connections.

In what way does the multiple arrangement of cells differ from the series arrangement?

How much electromotive force will be developed by five cells connected in series, and how much by five cells connected in multiple?

How are cells connected when it is desired to obtain greater current without increasing the electromotive force of a battery?

Radio Telegraphy.

TRANSFORMERS.

Transformers may be divided into two classes, depending on the type of the laminated core, whether with the open magnetic circuit, as shown in Fig. 1, or with the closed magnetic circuit, as shown in Fig. 2. These terms apply to the iron as a path for the magnetic field. Thus in Fig. 2 it is seen that the magnetic lines *M* have a continuous path or circuit through the iron, or, as it is said, a closed magnetic circuit, whereas in Fig. 1 the path of the lines is partly through the iron and partly through the space outside, or, as it is said, an open magnetic circuit. In both figures the direction of the field as it exists at one instant is indicated by arrows, but it must be remembered that the field is continually reversing its direction as the alternating current changes its direction. Both types of transformers are in general use, although it is probable that the closed magnetic type is now being used more than the other. There is no essential difference in efficiency of operation. Practical experience has shown, however, that in general it is not always possible to interchange transformers of the two types in any one set, particularly in quenched spark sets, where the alternator, transformer and condenser of the closed oscillating circuit must be designed as a whole to secure the best results.

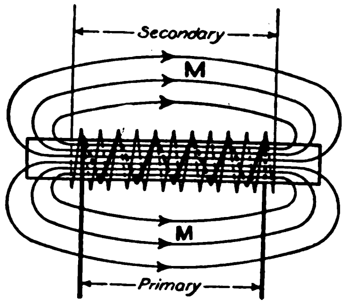


FIG. 1.

Transformers may be divided into two types, depending on the nature of the insulation, whether oil insulated or dry insulated. In the first the transformer is completely immersed in a suitable insulating oil, such as transil oil, in an iron tank provided with a cover to keep the oil from spilling, through which the terminals extend, strongly insulated, as with porcelain for example. In the second type strong insulating fabrics or materials are used around and between the windings, which are saturated with a nonfluid insulating compound. In the higher voltage transformers of both types the secondary coils are often heated in a vacuum to remove the air and moisture, dipped in an insu-

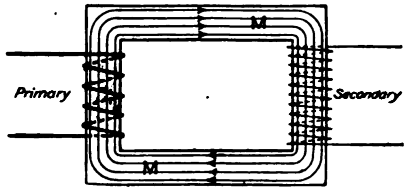


FIG. 2.

lating varnish or compound, and baked until they are hard so as to protect the winding, exclude moisture, etc.

The connections of the transformer, etc., are shown in Fig. 3, where *A* is the alternating current generator, *K* the telegraph key, *T* the transformer with primary and secondary windings, *C* the condenser, *S* the spark gap, and *L* the inductance. There is no essential difference in operation of the two kinds of connections, the choice generally being made on account of some convenience of wiring.

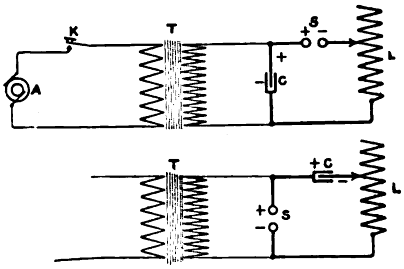


FIG. 3.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

What is a resonance transformer?

Into how many classes may transformers be divided?

What is a closed magnetic circuit and an open magnetic circuit?

Is there any difference in the efficiency of the closed and the open magnetic circuits?

What are the two types of insulation used in the construction of transformers?

What process is employed in insulating the secondary coils of high voltage transformers?

Telephony.

THE TELEPHONE INDUCTION COIL.

If the two wires bringing current from an electric battery are connected respectively to the front and back of the telephone transmitter button, the current from the battery must flow through the carbon granules. The amount of current flowing through the button will depend upon the opposition or resistance which the carbon granules offer to its passage. This resistance depends upon the pressure between the granules, and since their pressure changes continually with the vibrations of the diaphragm, the amount of current flowing through the transmitter button must also change continually with the vibrations of the diaphragm.

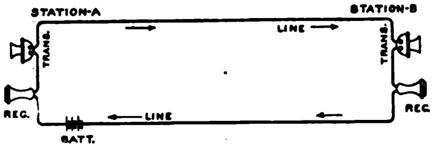


FIG. 1

In the early days of the telephone and many years before transmitters and receivers reached their present degree of mechanical perfection, the most efficient talking circuit which could be devised was arranged as shown in Fig. 1, in which the current from the battery passes first through the receiver and transmitter, at "A," out over the line to "B," through the transmitter and receiver at "B" and then back over the line to the battery.

When no one is speaking into the transmitter at either station, the current in the circuit is constant and its strength will depend upon the combined resistance of all the parts of the circuit.

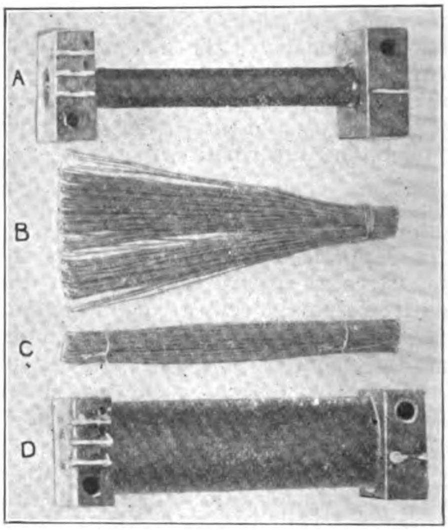


FIG. 2

If the stations are so close together that the resistance of the two-line wires joining them is very small, the current in the circuit will be very nearly of the greatest possible strength, and differences in the transmitter resistance at station A that are caused by the vibratory motion in the transmitter diaphragm will produce large changes in the current which flows through the receiver at station B.

If, however, the stations are some distance apart, so that the greater resistance in the line wires causes the current to be weakened, and if any one speaks into the transmitter at station A the differences which occur in the transmitter resistance will produce correspondingly smaller changes in the current.

Thus the resistance of the line wires connecting two stations was the most important factor in determining the maximum length of this early telephone transmission circuit. It was absolutely essential to devise some means of preventing the resistance of the line wires from controlling the strength of the current supplied to the transmitters at either station. This necessity lead to the development of the induction coil.

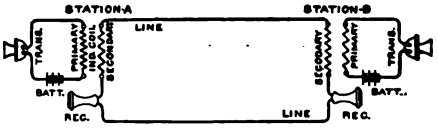


FIG. 3

Fig. 2 shows the different parts of an induction coil used commonly in telephone circuits. The part marked A is a paper tube or spool, provided with wooden heads for holding the copper windings. An iron wire core fits inside of the spool. This core is shown in the illustration with one end bound and the other free, B, and also with both ends bound, C. The finished coil, with the copper windings on the spool and the core of iron wire inside the tube, is shown at D.

The wound spool has two separate windings. One of these, known as the primary or first winding, is wound directly on the spool, while the other, known as the secondary or second winding, is wound over the primary. The method of connecting the windings in the circuit is shown in Fig. 3.

(To be continued.)

QUESTIONS ON TELEPHONY.

What causes the variation of the current flowing through the carbon button of the transmitter?

How is the resistance of the line wire prevented from influencing the strength of the current from the transmitters?

At what times does a constant, or direct, current flow through the transmitter and when is the current variable?

Shop Talk.

BY THE OBSERVER.

If all of us had a good disposition at all times, I am afraid this would be a sort of insipid world; yet, if we had a mean disposition at all times, the world would seem sour to us, and the rest of the world would consider us soured.

The foregoing paragraph is written with a view of calling attention to the so-called chronic kicker. Maybe he is a traffic supervisor, repeater chief, wire chief, chief operator, or a "Knight of the Key." Regardless of the position he holds, he is soon found out. But, shall we condemn him without a trial? No, a thousand times no.

Human temperament differs and what might be considered as chronic kicking may be the man's way of getting results, or the expression of impatience at not securing results.

Exhibit A.—A traffic supervisor issues orders to certain operators. He is called to another location and tied up for some time. On his return he finds positive orders miscarried. Something went wrong and in common parlance "he explodes." Now while I do not favor the explosion, I can scarcely blame him, for the man is loyal and feels a sort of personal loss. Such an occurrence may happen several times within a short time, and no one can condemn the supervisor, but I would suggest that he administer his rebuke in a low tone, be plain, forcible and polite. Either habit will grow. Try it.

Exhibit B.—The repeater chief often gets continual reports that a certain circuit is "rotten," when a certain operator is thereon. He listens and finds the circuit is O. K. and he explodes. Don't do it. Merely call the traffic supervisor into confab and let him do the rest. The work of a repeater chief is often trying and frequently he gets tied up, due to one cause or another; several other calls come upon him and owing to his great desire to reach all around, becomes nervous, and at times ill tempered. The man is loyal, energetic and wants to conquer something that will produce results, therefore, if at times he seems a little cranky, do not call him a chronic kicker, but make allowances.

Exhibit C.—The wire chief. This refers to the men on the board. There is not a single patch, swap or test, that he can make alone, if the trouble is outside of his own office. Testing wires during clear weather, when one gets proper co-operation, is comparatively easy, but not so in wet weather. Now the wire chief is at times confronted with most of an important route down. He knows the only way he can get a circuit is by a patch and frequently it happens that just when he is about to "make the patch," his test wire will swing, or go open. He tries several times and gets same results. He keeps plugging away. He gets it at last, or may be he is defeated. Perhaps when he raises the test office, the man that knows how has gone to dinner; or one of the most important way wires in the office is open or grounded. He runs it down and strikes a man that cannot even cut out for the open, or tell him if a ground is on, etc. The man that knows will be back later. There are several other cases of trouble calling for the wire chief. Do not classify that man as a kicker because he happens to "explode." Of course exploding does no good and it is best that he hold his temper and handle the case in a mild, firm and efficacious manner.

Exhibit D.—The chief operator's work is mostly supervisory and executive, he being held responsible for the proper maintenance and general results of the entire office. He has much to keep his mind occupied and I certainly feel sorry for any chief operator that has subordinate chiefs that will not at all times go to the limit to produce results. In view of the many duties that devolve upon the chief operator, it is but natural that at times he may act a little harsh and perhaps take what might appear as too drastic action, but if he adheres to fairness, regardless of sentiment, he is simply doing his duty. An oral reprimand from the chief operator should be made quietly and never should be done when he is at the "exploding" point. The "Knight of the Key" has only to obey instructions, make every effort to attain the title of a gilt-edge operator, refrain from unjust remarks over the wire, study some good books, subscribe for and read TELEGRAPH AND TELEPHONE AGE and you are in line for advancement. Suppose the advancement does not come, you say. Well, you will never lose anything by being better schooled in intellectual philosophy. It will come.

(To be continued)

Mr. Michael Fitzgerald, an old time cable expert, now living in retirement at East Brewster, Mass., writes: "In renewing my subscription for another year I wish to inform you that now more than ever, the AGE will be of great value to us, when so many of the fraternity are joining the ranks of our fighting men. We shall follow the fortunes of our boys with keen interest and sympathy, and our best source of information concerning their service will undoubtedly be in your always welcome publication. If the young fellows now at the key appreciated the AGE half as much as we 'has-beens' do, you would have no cause to complain of hard times."

"Jack" Selden.

BY RALPH W. POPE.

I was much interested in the reference to "Jack" Selden in the article on "The Christian Religion and the Morse Telegraph," by Walter P. Phillips, printed in your issue of January 16. The following account of Mr. Selden's career and personality may be of interest to your readers.

When the House printing instruments were discarded by the American Telegraph Company, about 1860, the operators apparently faced a serious problem. Few if any of them were Morse experts. They readily learned, however, to operate the Hughes printer and its successor, the "combination" instrument, which was used to a limited extent on through circuits between important centres. While this service did not absorb the entire force of House operators many were appointed office managers, or placed in clerical positions.

John E. Selden, familiarly known throughout his life as "Jack," was perhaps as well equipped to "face a frowning world" as any of the brotherhood of the keyboard. When the New York State telegraph line using the House printer reached Rochester, Jack was selected as being properly equipped to learn what was then considered a mystic art. It was perhaps ten years later when I first met him, he being office manager at Springfield, Mass., and I a country stripling of fifteen, serving for a few days as a substitute "combination" operator in the place of my brother Franklin Leonard, who was then holding down the Springfield end of the printer circuit to Albany and way offices. At that time Jack was perhaps twenty-five years of age, of stalwart frame, with square shoulders, over six feet in height with a black beard and an unusually deep bass voice.

JOHN E. SELDEN

A blue pencil was required by every operator for marking the office time on the printed tape as each message arrived, was counted and torn off for relaying or delivery. At that time I had never seen a blue pencil which I imagined must be of considerable value. Even through the fifty-eight years which have elapsed I can remember how my knees trembled as I approached this impressive personage, and humbly asked for this precious implement.

"Unlock the lower drawer, and help yourself, sonny," was the reply, and the gently modified tone of his voice, quickly removed all my fears, and won my heart. Until we parted in this world at Chicago in June, 1911, this friendship, born at Springfield in 1859, had not only continued but had been refreshed by occasional meetings as conditions permitted. Many periods in his active career are unknown to me, but like millions of other country-bred young men he heard the call of the metropolis, and while at the 21 Wall Street office manned the Hudson river wire to Albany. There were then occasional intervals when nothing was doing, by reason of a break in the circuit, and if there was reason to believe the interruption would continue till the next day electricity was superseded by steam in order to clear the hooks.

Occasions have arisen in later days when a similar practice has been necessary to conform with a strenuous situation.

During one of these lapses Jack became poetic and I regret that but one verse of his production is available as a tribute to the author, presenting simply a phase of wire trouble in early days:

Little that indulgent public
  Know how they are skinned alive;
We know better how its managed,
  Package by express at five.

The motive power of the House printer in such large offices as New York was usually supplied by an Irishman, and one of the survivors of the clan personally known to me, as well as thousands of others, was doorkeeper Tom Finnegan who officiated for many years at 195 Broadway. He was a co-worker with Jack Selden in New York, whose fellow operators as I have reason to believe were John Horner, Henry Bentley, John Oltman, E. A. Calahan, Joseph L. Edwards, M. S. Roberts, J. C. Hinchman and perhaps others, many of whom continued in the service for years, until their death or retirement.

In 1858 Rufus B. Bullock was manager of the Springfield office. He was one of the few operators who could read by sound from the House printer. This was an unusual accomplishment, the letters of the alphabet being recognized by the number of rapid pulsations, from 1 to 28. Certain words were readily recognized, "Cincinnati," for instance. This was merely a novelty of the service, but of no practical use, as was the development of Morse sound reading from the original embossed record. Mr. Bullock resigned from the telegraph service in 1858 and entered the employ of the Southern Express Company at Atlanta, Ga., subsequently becoming governor of Georgia. He was succeeded at Springfield by Jack Selden just prior to my debut in that city as a "sub." The "combination" which was supposed to embody the best features of the Hughes and House printers, was itself gradually supplanted by the Morse apparatus. The slogan of the House system had been "prompt, accurate and reliable." Its rivals in Springfield were the Morse and Bain lines, nicknamed respectively by Jack as the "woodpecker" and "dyetub" systems. Even in those days when the "bug" was unknown, all errors in transmission were supposed to emanate from the Morse operator.

About this time Jack had read the handwriting on the wall, and began to practice Morse, but never became really expert. About 1860 he was appointed manager of the Pittsfield (Mass.) office, which was the relaying station for the Housatonic line to Lenox, Lee, Stockbridge and Great Barrington. It was also an important office on the through wire from Boston to Troy then, I believe, designated as No. 10. In February, 1861, I left the Housatonic Railroad service at Bridgeport, and was engaged as operator at Great Barrington by the late Theodore M. Chapin, who had taken the managership provided he could obtain my services. Jack and I were thus brought into that close relationship existing between operators working a wire together, but conditions had changed, for by that time I was the better Morse operator as he still relied on the "tape." One day his local battery gave out, and he told me that if I would send slowly and plainly he thought he could take my message from the relay by sound. Of course I readily consented, and he was so gratified at his success that he said if I would continue to send my business in that style he would "cut out" his register.

R. W. POPE AS HE WAS IN 1862 AND AS HE IS TODAY

After the "blue pencil" episode, there was but one thing for me to do, and the agreement was made. It was rather a curb on my rising ambition as an operator, but perhaps this very experience in "plain Morse" was subsequently appreciated by the man at the other end. Even then there were ominous rumblings of the civil war, and when the bombardment of Fort Sumter aroused the war spirit throughout the North, East and West as well as the South, the telegraph was the first department of industry to feel the effects of the call to arms. Every country office became the recipient of war news, and every operator received press reports. Although Jack's sympathies were with the "other side," from the beginning to the end, our personal relations were never strained and business proceeded as usual. In addition to his telegraphic duties he was also ticket agent for the Boston and Albany Railroad. Pittsfield being an important railroad junction and a mustering point for troops, Jack was soon overwhelmed with work and called for my aid. While I was with him he gave little attention to the telegraph. He was never reconciled to the he approve of checking the accounts of one office against another, with its periodic accompaniment abandonment of the House printer. Neither did of error sheets received from W. H. Abel, auditor.

"The system of the old State Line at Rochester was the best," said he. "Whenever the operators wanted money, they went to the cash drawer and helped themselves, sometimes leaving an I. O. U. The messengers did the same and what was left at the end of the month we sent to headquarters." This system, or rather lack of system, may account for the bankruptcy of some of the early companies. So far as I know, no attention was given to these error sheets, beyond filing them as they arrived behind the wires leading down between the window frames and near a gas bracket over the operating table. During a thunderstorm in the summer of '61 lightning followed the wires into the office, jumped to the gas pipe, and the error sheets were immediately in a blaze. I jumped up and proceeded to extinguish the flames, but Jack checked me for a moment, saying: "Let the d—d things burn. It is an act of Providence." Having had no connection with the office accounts, I never knew the result of this free and easy method.

The next winter I went to 145 Broadway, New York, and from there to New Haven and Providence. We drifted apart for a few years, but finally came together again in Providence. The late Henry C. Bradford was then manager of the Providence office of the American Company. He was an intimate friend of Jack, and a House operator. When the American Company built the "People's Line" as a "fake" opposition to itself and the rival Independent Telegraph Company, Jack was placed in charge of the Providence office, probably at the suggestion of Mr. Bradford. The status of the supposedly competing companies was well understood by the entire staff, and this led to the extension of Jack's circle of friends, which thereafter included, among others, Walter P. Phillips and the late Albert L. Suesman. The final absorption of the People's Line probably brought about another change in Jack's affairs, but my knowledge of his wanderings thereafter is rather vague. Eventually, however, he was employed by the old Dutchess and Columbia Railroad in some official capacity in its extremely limited telegraph service. During this period of his career he married his second wife, a daughter of Mr. Rothery, who owned and operated a file factory at Matteawan, N. Y. Jack was the bookkeeper for this concern and for several years made his home with the Rothery family. Many years later Jack wrote me that his only son "had taken to himself a rib with a little fat on it."

Some of the older Postal Telegraph men will perhaps remember what was I believe Jack's last appointment in the service of the Postal Telegraph-Cable Company, and at one time operator and clerk at the branch office, No. 76 Park Place, New York, under the managership of Mr. T. J. Donovan. After two years' service in that office he was transferred to a clerical position at 253 Broadway, about 1904. A little later he removed to Chicago, making his home in that city with his son. He naturally assumed those household duties which devolve upon a handy man and up to the beginning of his last illness repaired locks and clocks, mowed the lawn in summer and stoked the furnace in winter. The death of his only son broke the last tie which had made life worth living and he was quite reconciled to the end, which came during the winter of 1912-13.

Overhead Lines and Inductive Interference.

At the special meeting of the National Electric Light Association held in New York, May 9 and 10, in place of the regular annual convention, the committee on overhead lines and inductive interference presented its report. The report outlines the status of inductive interference as regards ground-return rural telephone lines, metallic circuits and series lighting circuits. It emphasizes the importance of power-company engineers co-operating with telephone engineers in the solution of these problems and informing themselves as to the principles on which means for mitigation of induction are based, so that they may be thoroughly familiar with the conditions which are likely to lead to inductive troubles. The report also outlines the progress made in various states during the year on rules affecting overhead-line construction and indicates their relation to the National Safety Code.

While no uniform solution has been found for these problems, power companies have, in general, taken the position that grounded telephone circuits are not a standard or approved method of construction, and that the telephone company could not insist upon any changes by the power company until it had put its own lines in standard condition. However, power companies have, in some cases where lines are owned by farmers, borne a portion of the expense of making the circuit metallic, as a matter of public policy.

The report also embodies an appendix, written by J. B. Taylor, outlining some of the fundamental principles of inductive interference.

Secret Telegraphy.

Mr. Patrick B. Delany gave a demonstration at his laboratory, 395 Broadway, New York, a few days ago, of some new telegraph apparatus designed for the purpose of securing secrecy of transmission. One device renders it impossible for an eavesdropper within hearing distance of a sounder to read what is being transmitted. Another method secures absolute secrecy by using two wires over which signals alternately travel by different routes, the first and third dots of letter "H", for instance, might go by the way of Pittsburgh from New York to Chicago, while the second and fourth dots could go by the way of Buffalo, all being united in proper sequence at the ordinary Morse relay and sounder at Chicago.

Mr. Delany has also devised a method of secret transmission by which any group of dots is transmitted over the wire as a dash which is resolved into dots at the receiving end. This method prevents eavesdropping at any station along the line, even by the company's employes, because nothing is heard but a succession of dashes and single dots.

Convention of Order of Railway Telegraphers.

The biennial convention of the Order of Railway Telegraphers was held in Seattle, Wash., during the week beginning May 13, 450 delegates and their families being present from every state in the Union and most of the Canadian provinces. The convention, took for its guidance, the war-time policy recently declared by the American Federation of Labor.

Grand-President H. B. Perham conducted the meetings. His report and the reports of the other officers show that the Order has a total membership of 50,000, ten thousand of whom were admitted since the last convention, and that more than 200 railroads are now covered by union agreements. The wage increases during the past two years, brought about by the Order, amounted to more than $3,500,000.

The Order of Railway Telegraphers was organized thirty-one years ago and its paid-up membership is now the largest in its history, according to the report of Grand-secretary L. W. Quick.

Old Timers' Meeting for This Year Deferred Until 1918.

At a meeting of the local officers and members of the Executive Committee of the Old Time Telegraphers and Historical Association held at Cleveland, Ohio, May 1, the following resolution was adopted:

Resolved: That owing to the uncertain warlike conditions existing the meetings of the Old Time Telegraphers and Historical Association and the Society of the United States Military Telegraph Corps, scheduled to be held in Cleveland this year, be deferred until 1918 at the same place, the dates to be selected later.

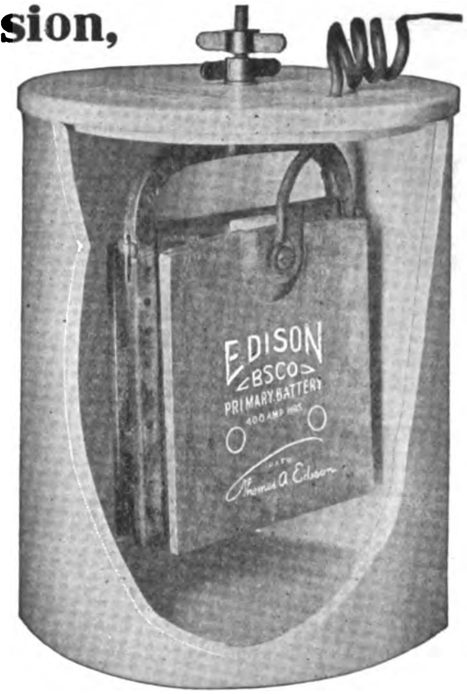
(Signed) W. H. Canniff, president; D. J. Ross, F. W. Sprong, and T. W. Hill, vice-presidents; D. C. Moon, H. P. McIntosh, and W. R. Woodford, executive committee.

Electrical Pocket Book.

The *Mechanical World* of Manchester, England, has issued its Electrical Pocket Book for 1917. This work of 300 pages includes a collection of electrical engineering notes, rules, tables and data which will be found very useful by the practicing electrical engineer. It is intended principally for electric lighting and power service. Besides the technical and practical information the book contains a diary and space for memoranda for each day of the year. The price of this work is 75 cents per copy, and copies may be purchased of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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THE use of Kerite is the logical result of experience.

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KERITE INSULATED WIRE & CABLE COMPANY
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THE RAILROAD.

The Railway Telegraph Superintendents' Convention.

Active preparations are being made for the next annual meeting of the Association of Railway Telegraph Superintendents at the Hotel Raleigh, in Washington, D. C., September 11, 12 and 13, and it is the expectation that this meeting will be one of extraordinary importance to the members. The rapid changes and developments in railway service are bringing to the front many new problems for the telegraph and telephone departments to solve. President M. H. Clapp is keeping in close touch with developments, and invites all the members who desire to have general investigations made, or who know of developments, which would be interesting to the members, to call the attention of the chairman or the members of Special Committee No. 6 to such matters. This committee looks after the subjects of telegraph and telephone development, and is one of the busiest of the committees.

Mr. W. L. Connelly, Gibson, Ind., is secretary of the Association.

Ground Wires For Railroad Offices.

Ground rods should be avoided wherever possible. When they are necessary, they should be installed in a manner similar to driven iron pipe grounds, and the ground wire soldered to the top of the ground rod after the rod has been driven.

In general when a coil of wire is buried in the earth, an excavation at least six feet deep should be made until moist earth is reached. Two No. 9 B. and S. bare copper wires should be made up into a coil of at least six turns not less than eighteen inches in diameter and placed in the excavation horizontally. Two feet of moistened coke or charcoal about pea size should be placed both over and under the coil. The coke or charcoal should be thoroughly moistened at the time of installation and the earth above the coil firmly tamped down.

When using a copper or galvanized iron plate, an excavation not less than six feet deep should be made until moist earth is reached. The dimensions of plate to be used should be at least two by two feet and it should be placed in the earth horizontally. The thickness of the plate should be at least sixty-five thousandths of an inch and correspond to No. 16 Birmingham or Stubbs' gauge for either the copper or iron plate. The plate should be placed in the excavation with two feet of crushed coke or charcoal, about pea size, both under and over the plate. The coke or charcoal should be thoroughly moistened at the time of installation and the earth above the plate firmly tamped down. Ground wires should be thoroughly soldered to both sides of ground plates.

Dempsey Code for Handling of Troops.—The special committee on national defense of the American Railway Association, and the quartermaster-general of the United States Army, have adopted codes for use in handling troops which are being especially prepared for that purpose by Mr. J. Edwin Dempsey, of Chicago, author of the Dempsey Telegraphic Cipher Codes. The code to be used by the defense committee is a gift from Mr. Dempsey. It will be used on all the railroads which are members of the American Railway Association.

Improvement in Synchronism Devices for Printing Telegraphy.

Mr. Romyn Hitchcock, of Ithaca, N. Y., well known to telegraph people through his work in connection with the development of high-speed machine telegraphy, has invented a method of controlling the synchronism of telegraph apparatus without line signals by the regulative rate of a clock at each station. In the language of the patent, the invention involves a telegraph system of special design, with transmitting and receiving devices moving at uniform and constant speed, which speed is established and controlled locally and independently of line impulses, and comprises transmitting devices in the general nature of sunflower disks, and receiving devices of corresponding character adapted to be operatively connected at intervals to driving devices moving at substantially the same speed as those of the transmitter, and may be used for many purposes, among which a typical use is for the operation of printing telegraph instruments.

The distinctive feature of this invention is the complete disconnection of the synchronously moving parts from line control and the regulation of rate of speed at all stations by local pendulums all having the same period of vibration, preferably a half second of mean solar time, whereby the speed of rotation is not only constant, but an exactly known rate. The rate being universally known, it can be established for all stations, however remotely separated, without telegraphic signaling for testing or verification.

MUNICIPAL ELECTRICIANS.

Rochester, N. Y.—The new fire and police telegraph system went into operation in the Twenty-third ward at Rochester, N. Y., May 21. It is composed of six police and six fire boxes, and includes the flashlight police call. The system is local and entirely distinct from the city system. H. C. Biblack is the operator.

INDUSTRIAL.

The Railway Electric Manufacturing Company, Milwaukee, Wis., is making Remco selective train dispatching and special way station telephone equipment which is meeting with much favor and giving satisfaction. The company has a type of telephone which eliminates cord wear, thereby assuring efficiency and economy. It has recently obtained contracts for additional circuits from the Oregon Short Line, and also supplied a railroad, threatened with a strike of its telegraphers, with several circuits, thereby enabling it to demonstrate to its operators that they could be dispensed with.

An Early Telegraph Line.

BY GEO. C. MAYNARD, SMITHSONIAN INSTITUTION, WASHINGTON, D. C.

The Erie and Michigan telegraph line, which extended from Buffalo, N. Y., to Milwaukee, Wis., was constructed under the direction of Ezra B. Cornell and Colonel John J. Speed, with M. B. Wood as superintendent of construction of the western division, which extended from Detroit to Milwaukee. Construction on this division began simultaneously at Detroit and Milwaukee. The builders from the western end came over into Indiana and established the first office in the state, at Michigan City. A few days later the builders from Detroit extended the line into South Bend, Ind., and there established the second office in Indiana. Mr. Charles M. Heaton opened the South Bend office in March, 1848, and continued as operator until June, 1861. From the latter date until March, 1865, his son, Charles M. Heaton, Jr., was the operator. The instruments with which the office was first opened remained in use in that office until 1872, Thomas D. Baird being the operator. The South Bend relay and register are now on exhibition in the telegraph collection at the United States National Museum in Washington, D. C. The register bears the name of J. Burritt & Son, Ithaca, N. Y., as the manufacturer. The relay bears no manufacturer's stamp. They are good serviceable instruments.

The Ancient and the Modern Telegraph Office.

BY THOMAS L. JAMES.

The article that appeared in your issue of April 16, on page 172, under the title of General Manager C. H. Gaunt's recent trip, is extremely interesting to old-timers like the writer. It brings to our view a comparison of the old with the new or modern up-to-date telegraph equipments.

While in the telegraph service many years ago the writer had a fondness to work in as many offices as possible each year and he can assure you that some of the telegraph equipments of thirty-five or forty years ago would be regarded in these days as curiosities and only fit for a museum. Everyone will admit, of course, that an excellent telegraph service was rendered in those days in spite of the imperfect equipment and unsatisfactory conditions. There were very few switchboards in main offices at that time that did not have at each end, resting on the floor, large cuspidors. The switchboards were dingy in their makeup but they answered the purpose, for it must be remembered that there were no high-tension currents to deal with, there were no fuses to blow out and there were absent the thousand and one pieces of apparatus that are now a necessity in every main office. These were the has-been offices.

A writer in a recent article in your publication referred to a visit of the general superintendent to the Tacoma, Wash., office thirty-odd years ago. The visiting officials were amazed to find the sign up side down and the office in a more or less delapidated condition. I have not been in the telegraph business for many years but I now visit as many offices in the course of a year as I did when I was rated as a good knight of the key. I have been a traveling salesman for the past twenty years. I manage to keep up to date telegraphically by subscribing for and reading your journal from cover to cover. In addition to this I pay my respects to the local telegraph managements in many of the cities visited in the discharge of my duties. I am, therefore, in a position to testify to the excellent and businesslike appearance of ninety-nine out of every one hundred telegraph offices in the larger cities of the country.

The development of the telegraph equipment from a thing of a few pieces of brass and iron fifty years ago to an enormously large and rapidly growing and well organized busy workshop of today is a subject which telegraph historians should record in their fullest details. It will make mighty interesting reading to all who have witnessed this wonderful growth and to those who follow us who have history alone to furnish them with the facts.

Operator Lifts Over Twenty Tons per Night.

J. H. Johnson, an Associated Press operator in Boston, while working at Manchester, N. H., a year ago, devised an ingenious method of determining the amount of work performed by him in one night, expressed in mechanical terms. By rigging up a postal scale in a special manner he found it required a pressure of ten ounces on the typewriter keys to print each letter, and in the course of a night, with an average report of 14,000 words, allowing five letters to a word, the total pressure exerted would lift 700,000 ounces, or 21¼ tons.

This computation was the result of a discussion which arose in the office of the Manchester paper as to which man on the paper worked the hardest.

The award was made to another man, but Mr. Johnson, not being satisfied with it, made the investigation of his own work on his own account, with the result that he was declared to be the hardest worker in the office.

THE AMERICAN COMMITTEE ON ELECTROLYSIS, appointed by national engineering societies and other interested associations and corporations, has issued, in book form, a preliminary report prepared for submission to its principals. The committee consists of representatives of the American Electric Railway Association, American Gas Institute, American Institute of Electrical Engineers, American Railway Engineering Association, American Telephone and Telegraph Company, American Water Works Association, National Bureau of Standards, National Electric Light Association and Natural Gas Association.

THE TELEGRAPH AND TELEPHONE LIFE INSURANCE ASSOCIATION has levied Assessment 621 to meet the claims arising from the deaths of Alice J. Nash, Avalon, Pa.; J. F. Purcell, Lake Mohegan, N. Y.; J. H. Montgomery, Passaic, N. J.; J. F. Tait, North Sydney, N. S.; General L. Green, Mobile, Ala.; F. A. Landee, Metropolis, Ill.

Efficiency Engineering in the Telegraph Service

(Continued from page 230, May 16.)

The subject of service is almost inexhaustible. In an article like this, however, a limited space only is available to discuss each subject embraced under the general head of efficiency. The idea is to say just enough to force men to think for themselves once they get started the reasons for the whys and the wherefores incident to every question. The mental effort displayed by each person will land him within the threshold of efficiency.

It must not be supposed however, that efficiency cannot be carried too far. Thrift is efficiency in another form but it also can be carried too far and today it is asserted by many that the country is confronted by misguided thrift. In our efforts to be economical and patriotic we find the country going to extremes in the opposite direction which is just as great a menace as wastefulness and extravagance. This has been the subject of addresses by prominent people of late because students of political economy have observed to their amazement that thrift was fast becoming a calamity to the nation. The point is to differentiate between destructive and constructive thrift. One authority says that in times of peace or war, waste is reprehensible but indiscriminate tight-fistedness is worse, because in such conditions the provident are made to suffer with the improvident. Because the whole nation suddenly has become conscious of the necessity of thrift, we as individuals should take care not to deflect from their normal courses the tides of the nation's money that turn the wheels of industry. Everyone can distinguish the difference between prudent living and wastefulness. If a man buys a suit of clothes, a pair of shoes or a hat, his money goes into legitimate circulation and furnishes uses for capital and employment for labor. As a nation we may stand face to face with economic hardships unless each individual is governed by common sense, prudence and foresight. Every man should adminster his income in a clean, honest, legitimate and patriotic manner. We should not tear down on one hand while we are trying to build up on the other.

Those in charge of telegraph and telephone plants or other enterprises should not hesitate but be courageous and keep on going, giving careful attention to the requirements of old customers and being ever on the alert in quest of new ones. Managers can point out to the business community how additional orders can be secured if they notice a tendency on the part of the business man to regard the telegraph or the telephone as a business luxury. The country has everything to make itself prosperous. The billions of dollars which are being raised for war purposes will eventually return into the pockets of the people. Even the money loaned to the governments abroad is being spent immediately in the United States.

In the matter of individual expenditure every man should be guided by his own necessities and the needs of his country. No one should be a slacker in the business world. This is no day for the coward or weakling. Be brave and confident. Remember the most acute need of our nation today is intelligent, productive, constructive thrift.

Every employe of the telegraph and telephone companies can be depended upon to do his full duty in this emergency. In this way he will render the best possible service to himself, to his employers and to the nation at large.

Telegraph and telephone managers should be the real prime movers in sales and promotion work in the business community. No business man will fail to listen to a canvasser who has a proposition to make that almost to a certainty insures additional business at a small outlay expended for telegraph service. The telegraph and telephone extends from the buyer to the seller, no matter what the distance may be that separates them. The wire industries give impetus to sales, and bridge the space between supply and demand.

There never again need be any hard times in telegraph or telephone circles. If telegraph service is not apparent create it by showing the business man who complains of dulness in trade that he need not lament over conditions but avail himself of the wires to search the country for orders. His telegraph communications will receive immediate attention.

Prominent business houses inform us that each morning they receive a large number of telegrams all of them containing orders. Imagine if you can, the saving of time. It figures up about as follows: A telegraphic order reaches a business house from a customer 1,000 or 1,500 miles distant. The saving in time so far is two days. The goods are shipped the same day the orders are received and if they are forwarded by express they actually reach the buyer about the same time that a mail order would reach the seller. The two days saved is of incalculable importance to the buyer. His promise of speedy delivery has been fulfilled and pleased customers are the result. We are frequently told to use the express instead of freight to save time, that it is worth the difference in cost. If this is true, is it not infinitely worth more to a business man to use the telegraph instead of the mails? It is surely worth more than the difference in cost.

(To be continued)

Associated Press Election.—At the recent meeting of the board of directors of the Associated Press, in New York, officers were elected as follows: President, Frank B. Noyes, Washington, D. C.; first vice-president, Ralph H. Booth, Muskegon, Mich.; second vice-president, E. P. Adler, Davenport, Iowa; secretary and general manager, Melville E. Stone; assistant secretary and assistant general manager, Frederick Roy Martin; treasurer, J. R. Youatt, New York.

Mr. H. W. Dealy, secretary of the Gold and Stock Life Insurance Association, has addressed a circular letter to the members urging them to aid in securing 300 new members this year. "300 new members in 1917 is our slogan," he says. He mentions the activity in other cities toward the attainment of this result.

Telegraphers for Signal Corps.

Lieut. Col. Carl F. Hartmann, Signal Corps, U. S. Army Eastern District, has issued an urgent call for 3,000 expert telegraphers for the period of the war between the ages of eighteen and forty-five. He is appealing to former telegraphers who have retired or entered other lines of business to return to the key at least temporarily, in order that eligibles may be released for the service. Uncle Sam desires also the services of telephone switchboard operators, linemen and electricians. Pay corresponds to that of the regular army. Uniforms are furnished as well as transportation to the place of mobilization. Lieut. Col. Hartmann has gathered about him a consulting board of technical experts who are in close touch with the telegraph, telephone and radio situation, and is proceeding carefully, with the view that 3,000 telegraphers must be obtained, with as little injury to regular business as possible. He has assigned Fred W. McClintic, the well-known telegrapher, who took the Plattsburg course last year, to the Wall Street district in particular with instructions to enroll as many men as can be spared, in advance of the selective draft, which is effective June 5.

Those who desire to enroll, or who desire to return to the telegraph service temporarily in order to relieve an eligible for service can do their bit for the nation by applying to F. M. McClintic, care Gwynne Brothers, 25 Broad St., New York City, who will furnish further details on request.

The expansion of the Army has made promotion very rapid for those who can show ability and are adaptable. Men with special talents such as telegraphers as a rule possess are especially desirable in the Signal Corps. No first-class telegrapher need enroll as a private. If he possesses ambition and is willing to learn, the Signal Corps officers will give him an opportunity, and his progress depends entirely on his own ability and desire to climb.

OBITUARY

Death of William Marshall, Condenser Manufacturer.

William Marshall, aged sixty-eight years, the well-known manufacturer of electrical condensers, died at his home in New York, May 16th, after an illness of about four months. He was born in Liverpool, England, in 1849, and had been in the electrical business since 1874. His condensers had a wide reputation in America and abroad.

Mr. Marshall was identified with all electrical including telegraph organizations and was a regular attendant at the reunions of the Old-Time Telegraphers and Historical Association and the banquets of the various telegraph clubs. After the Civil War he was captain of the famous Hawkins' Zouaves which is now the Ninth Regiment of the New York State Militia.

It is understood that the condenser business will be continued by Mr. Arthur Graham who had been identified with Mr. Marshall for thirty-six years.

Charles A. Paxson, a member of the Society of the United States Military Telegraph Corps, died in St. Louis, Mo., May 19.

Mr. Paxson was operator for General Schofield at one period during the Civil War and did considerable line construction work in southwest Missouri where he acted as chief operator of the government service.

This Publication Issues a "S. O. S." Call.

We are issuing valuable literature, which can be had on application, descriptive of Telegraph and Telephone Age to which we hope to receive many new subscriptions, as well as orders for electrical and educational books, valuable and instructive to every member of the profession; Vibroplexes and Morse talking machine records, both in American and Continental codes.

We need the assistance of all at this time when so many of our subscribers are entering the government service which is making a great dent in our subscription list and when our expenses are being greatly increased by war conditions. We are anxious to secure sufficient new business to offset our unusually heavy losses and we want everybody, including subscribers and non-subscribers to help us.

Every telegraph man needs a Vibroplex, price $13.00 each.

Every one needs Telegraph and Telephone Age to keep him posted on current events; subscription price $2.00 per year, $1.00 for six months or 50 cents for three months.

No up to date telegrapher, whether manager, chief operator or the man at the key, can get along without a copy of "Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students," by Willis H. Jones, price $2.00. It is the best text book of the profession. "It is worth its weight in gold" is the opinion of hundreds who possess copies.

"Correspondence School Lessons in Elementary Telegraphy," by J. H. Penman, price $2.00, is a telegraph education in itself. Be sure and secure a copy and study it.

Phillips' Code, price $1.00 is another excellent book. It contains the standard abbreviations, which every telegraph man should know if he wishes to keep up to the minute with the rapidly moving telegraph procession.

The descriptive circulars that we issue will convince all that this publication is prepared to furnish everything needed to educate, instruct, interest and entertain.

Our journal has been endorsed by over 20,000 of the leading telegraph people during the thirty-five years of its career and in that entire time it has never had a dispute with any of its patrons. This is a record that we are proud of. During the same period we have assisted thousands to make their services more valuable and thus earn promotion. We can assist you and we hope you will give us the opportunity to prove it. Your correspondence and orders are solicited.

Address and make remittances to John B. Taltavall, publisher, Telegraph and Telephone Age, 253 Broadway, New York.

MR. JEFF W. HAYES' DEPARTMENT.

Address communications intended for the Chicago department to Jeff W. Hayes, Room 620, 111 West Jackson Boulevard, Chicago, Ill.

The Pleiades Club.

CHAPTER XIV.

There is no way in which material things can be smuggled into the sacred precincts of the planet Mars. There is no gold, silver or paper money, and nothing to buy, even if one possessed the money, for there are no material pleasures or enjoyments in this delightful spot.

Everyone is on a higher and more ennobling plane and it is only the few who still thirst after the lusts of the flesh who are rendered unhappy, but these are not quite purged of their earthly desires.

It was announced upon the ever-ready bulletin board, viz, the bright firmament of Mars, by the usual magic touch of the wireless wand, that there would be an entertainment given at the Telegraphers' Tabernacle, the chief feature of which would be a phonographic concert, to be followed by an exhibition of perfect Morse sending. There would also be an exhibition of "ham" sending and a rendition of a scene supposed to have taken place on "Old No. 4 East" upon Mother Earth in the early '70's.

The records were made by George W. Conkling, the past master of rapid transmission, who very recently joined the Pleiades Club, and Secretary Moxon did not inform his audience how he acquired the records, believing his duties did not extend to giving out state secrets.

Many thousands gathered around to hear the music, and it was certainly worthy to note that the clamor was for the patriotic national anthems. When the "Star-Spangled Banner" was rendered, everyone arose to his feet, many so-called foreigners also, thus showing their respect and admiration for the flag.

This preliminary was the beginning of the real event of the entertainment, and when the dots and dashes came humming over the talking machine much enthusiasm ensued.

"Puts me in mind of the time when I worked the Kansas City duplex alongside of Ed. Foote, with Paul Bossert and Jim Delong at the other end," said James B. Coulter.

"Yes, it sounds like the way Adam Beidler used to try and paste Emil Shape, on the first Milwaukee wire," ejaculated Harry McGill, who was an interested spectator and listener.

"I really believe that this talking machine is the same as the one we see illustrated in Telegraph and Telephone Age, and which I was going to purchase just shortly before I took my long flight," remarked Wm. H. Magehan, of St. Louis, a late arrival.

Selections from the talking machine were again in order, and each individual stated his preference of pieces to be played, and they were courteously taken care of.

Mike Tully asked to have "My Wild Irish Boy" played; Charlie Newton designated "My Old Kentucky Home" as his choice, and Lara C. Boone gave "St. Louis-Louis-Louis" as his favorite, all of which were rendered in the highest style of the art.

Joe Anderson, of Buffalo, would not be content until he had listened to "John Anderson, My Jo-John," and Billy Thurman laughingly remarked that the occasion put him in mind of the summer evenings in Oregon along in 1883..

Everybody voted the entertainment a big success and all expressed a desire to have a repetition of the programme very soon.

Timothy Collins, who was one of the "Great 8" in Omaha, and who later became a guardian of the peace in Buffalo, passed up the sun-kissed walk, whistling "A Policeman's Life is Not a Happy One," and Court Cunningham suggested that record should be procured so Tim could get the right swing to the air, which suggestion was acceded to.

"These talking machines and the telegraph records beat those old harps we used to hear talked of in the Bible," whispered Dick Tubman to his friend, Sam Cassidy, but the latter scouted the remark, declaring that the music of a jewsharp could not be excelled, and to verify his statement Sam gave a demonstration of an artist playing the jewsharp, which was received with applause.

"I don't feel like criticizing your choice of music," said John Leatch, recently of San Francisco, "but you really should turn back to the stirring melodies of California when they sang 'Empty is the Cradle, Baby's Gone.' "

"What a chestnut John Leatch has plucked," echoed Captain James R. Dennis, as he smiled complacently at his old-time colleague.

"Get your partners for Lancer's quadrille," came in stentorian tones from the master of ceremonies pro tem, A. R. Pippitt, and many ladies, once familiarly known to the fraternity in Chicago, New York, St. Louis, Omaha, San Francisco and other places throughout the United States, joined hands with their brother operators and were presently whirling on the green sward to the sweet strains of Strauss' Blue Danube waltz, which followed the more formal square dance.

The music was rendered by the miniature talking machine which had been entertaining the company all evening with songs, band melodies, telegraph records and now came in to be used for dance music.

It was surely a lovely scene and everyone in the vast assemblage had something nice to say about the great wizard of modern times, who has added so much, not only to the comfort of all mankind, but has found it practicable to have every household possess an instrument of joy forever, which will make life on the farm, the shepherd's hovel, the Indian camp fire, in fact, every place in this vast world, more delightful by the music and delineations reproduced by the modern talking machine.

It was ascertained from Secretary Moxon that the latest advices from Mr. Edison showed he had retired to the top of Pike's Peak, to be alone with nature and to solve some abstruse problems, and, understanding the vigils of the great inventor, Hankus Cowanus, a knight errant of the key, was detailed to signal the Peak in hope of receiving some intelligence from him.

"You can't do it," said Fred Moxon. "Your sending never did carry from Chicago to Cincinnati, even in your palmy days. Just leave it to me and you will have an 'extra' out next week which will tell you Mr. Edison knows every desire of your little heart and he is going about his Father's business."

The matter was allowed to rest there and we will get more reports from these wonderful people later.

Wang.

During the early '80's there was much railroad construction in Oregon and Washington and only Chinese labor could be found to do the work, and they did it quite well.

The Chinese Six Companies, a formidable employment agency, was a great importer of coolies and one Ah Duck was among those who came across the Pacific about this time to try his fortune at railroad building.

Ah Duck was nineteen years old, strong and muscular and inured to hard work, so the pick and shovel were but playthings for him. He was, like the rest of his countrymen, very economical, and in a year's time had paid the Six Companies the blood money exacted to bring him over to this land of freedom.

For five years, Ah Duck remained in the employ of the railroad company laying up dollar after dollar till he had accumulated $1,000 and then he determined to start in business for himself. He tried peddling vegetables, sawing wood, but finally located in a wash house where he did well.

Wing Moy Lung, another celestial, kept a store close by Ah Duck's wash house and the twain became warm friends, so much so, in fact, that Moy Lung made his friend an offer to sell his daughter Fat Choy, for $500 to become the wife of Ah Duck.

Two years later Ah Duck and Fat Choy became man and wife and a year afterward a boy baby was born to them which they named "Wang".

When Wang was five years old, his father was accidentally killed by a high binder gunman who mistook him for an enemy. Wang soon after commenced his career as a newsboy.

"What shall I holler?" he asked Jack Hamlin, the telegraph manager.

Hamlin looked at the little fellow and replied, "Rising Sun Stove Polish," and a minute later Wang's piping, childish voice was selling his wares while proclaiming the well known article so extensively advertised.

The papers found ready purchasers and the next evening Wang was again a caller at Hamlin's office.

"Beacham's pills" should attract attention and Wang was told to make that his slogan, and he succeeded admirably in making quick sales.

"The Dutch have taken Holland", "Erin go Bragh" and other like cries were given him and Wang found business good.

And so the boy grew up until he was ten years of age.

His home was close by the telegraph office and Wang was already a favorite with the clerks and boys of the office, who welcomed his debut as a messenger.

"No, my name is not 'John' Wang, nor 'Wangdoodle,' just 'Wang' and that's all," said Wang to the manager when he came to sign the payroll for the first time and the one syllable name was probably the only one of its kind ever attached to a Western Union pay voucher.

One day a young Irish boy, named Michael Flaherty, and an Italian lad named Icilio Celestino, were added to the force, but when they saw Wang dressed up in a messenger's uniform their noses went straight up in the air.

"What! do they employ Chinese as messengers here? I wont work with a Chink," were the remarks made by the new messengers.

Quick as a flash, Wang confronted the twain.

"What are you fellows talking about," he exclaimed. "You fellows are foreigners, you are Irish," pointing to Flaherty, "and you are a dago" turning to Celestino, and then drawing himself up proudly continued, "and I am an American. I was born under the stars and stripes and Uncle Sam is my father and friend, and neither he nor I will allow you to call me names or permit you to talk meanly to me." Never again was Wang's nationality brought into dispute, and his associates held him in great respect thereafter.

A slight figure, orientally garbed came into the messengers' room one day and quietly took a seat on the bench.

"Ha! ha! ha!" ejaculated one of the boys, "there is a little Chink woman on the bench, I wonder if she wants to don the cap?"

The remark was heard by Wang who had just entered the room and with a bound he was by the woman's side, patting her hands and face and caressing her. The Chinese never kiss.

A monosyllabic conversation now ensued between mother and son, for the woman was none other than Fat Choy.

"Boys," said Wang, and he looked at his colleagues proudly, "this is my mother and she has come over to invite you all to a turkey dinner on Chinese new years and we would like to have you all come if you can."

Fat Choy's popularity was apparent at once and she and Wang were escorted home by the entire force, all of whom promised to be on hand for the new year's dinner. And Wang grew up and made good. He imbibed a great love for his native country, but was ever ready with a helping hand for his father's people. He spent no time in idleness, but devoted every minute to study.

He early began the study of law which he followed up assiduously and being a fair Chinese interpreter, combined with a knowledge of the law, rendered it possible for him to serve his oriental brothers when they were unjustly persecuted.

Wang was among the first to persuade his countrymen to discard the queue, which began the era of their emancipation.

Wang is a telegraph messenger no longer. On a prominent window in the Board of Trade, one may read this legend:

Wang, attorney and counselor at law.

Wang early organized a militia company composed of young American-born Chinamen, which he offered to the United States when the crisis occurred with Mexico, and whose services were accepted.

There is a way for everyone to attain eminence in this world by carving out a pathway which is individually his own. Wang has shown us the way.

Chicago, Wake Up!

BY CHICAGO.

The article bearing the title of "Chicago, Wake Up," which appeared on page 198 in your issue of May 1 is certainly interesting and has set the writer to doing a little thinking. Our memory goes back to forty years ago. The fraternity in New York, Chicago and in other large centers in those days evidently did not need a Serial Building Loan and Savings Institution in which to save their money. Not one in twenty of us had the slightest idea of saving. You can say what you please about the old timers and the wonderful ability they displayed in managing the wire facilities of that period but they were sadly lacking in thrift. All praise therefore to the loan association of New York. It has taught men and women too how to save systematically.

The writers on this subject in your publication have overlooked the fact that members of the profession have hundreds of thousands of dollars invested in Western Union, in Mackay and in telephone stocks. Add this to the bank accounts, the value of real estate and homes possessed by employes of these industries, together with the huge sum invested in the Serial and we think the aggregate will assume a sufficient magnituude to convince other industries that the telegraphers in less than thirty years have forged to the front in financial standing. The record is a wonderful one when we stop to think it over. When we look around to place the credit for this condition where it properly belongs we naturally are led to the Serial Building Loan and Savings Institution of New York, which has always encouraged thrift among its members. Nine out of every ten of the stockholders in this institution admit that they never saved a dollar until they were induced to join the Serial.

Chicago telegraphers are not slow in saving money. Many of them have good bank accounts, stocks, real estate, coupled with good judgment as to the management of these properties. However, if a loan association will teach all who invest the value of thrift by all means the fraternity of this vast commercial center should establish a savings bank institution along the lines of the Serial of New York, which has done so much for the fraternity on the Atlantic seaboard.

Chicago Western Union.

E. P. Haas, Morse supervisor, was appointed assistant chief operator in charge of the sixth floor operating department, this being a newly created position.

Operators E. C. Perdue and W. J. Donnelly who were detailed to Jacksonville, Fla., on March 1, returned to Chicago recently.

LETTERS FROM OUR AGENTS.

New York Postal.

The many friends in this office of Mr. and Mrs. A. W. E. Poinsette are extending hearty congratulations to the young couple on the arrival, on May 13, of a son and heir. Mr. Poinsette is an operator in the employ of the Canadian Associated Press. Mrs. Poinsette, (nee Miss Alice Williams), daughter of all night chief, J. P. Williams, was formerly an operator in this office.

New York Western Union.

S. Heiman, of the division traffic superintendent's office, is the representative of TELEGRAPH AND TELEPHONE AGE, covering the various departments comprising the 24 Walker Street main office. Those who have orders to place with this publication can depend upon Mr. Heiman giving them his prompt attention.

J. V. Riddick who has represented the interests of TELEGRAPH AND TELEPHONE AGE at 24 Walker Street for the past two or three years has had his duties so enlarged that he finds it impossible to devote the necessary time to the interests of that publication.

Frank Riley, an operator on the night force, at Newark, N. J. who has been in this office for sometime past studying the multiplex system, died of pleurisy, May 22, after a brief illness. Mr. Riley was to have been placed in charge at the Newark end of the multiplex system now being installed between New York and that city.

The operators in the various departments a few days ago contributed ten cents each for the purchase of American flags. Over 1,500 subscribed to the fund. On May 29 the flags were appropriately dedicated under the auspices of the Educational Society. They will be suspended from the ceilings and hung on the walls in the rest room and restaurant and in each department.

The notice of President Carlton in regard to the Liberty Loan bonds has created much enthusiasm among the various forces. As soon as the details are received from the executive offices the favorable responses will be so numerous from 24 Walker Street, as to surprise those in charge of the distribution of the bonds.

The Gaumont Company has taken moving pictures of all the departments of the New York main office and will use the scenes in conjunction with the scenarios covering the handling of business by telegraph. The completed moving picture will be ready in about a month. It will be exhibited all over the country as an educational film.

The telephone bureau of this office has recently been sound-proofed with the result that the noise and vibrations have been reduced about fifty per cent. The rapidly increasing size of the bureau was fast making the department very noisy. This relief makes it possible to extend the facilities without any attendant handicaps.

H. B. McChesney, educational expert, attached to the office of vice-president in charge of traffic, gave an interesting and instructive talk before the Western Union Educational Society, May 16.

Saim Salim, of Constantinople, Turkey, who since previous to the breaking out of war has been in this country studying the telegraph and telephone industries and who could not return to his country on account of war conditions, has accepted a position with the United States Government as a wireless operator in the Signal Corps and is located at Fort Omaha, Neb. Mr. Salim became a practical operator in the telegraph school connected with this department and he made many friends while in New York. He is a great admirer of American institutions and when he returns home it will be with the kindliest feeling for the United States and her people.

Boston Western Union.

Samuel W. Eldridge, aged seventy years, a well known operator in this office, died of pneumonia May 7. At various times he occupied the positions of repeater chief, wire chief and quad chief, and latterly had charge of claim cases. He was for many years agent for the Telegraphers Mutual Benefit Association.

Pittsburgh Postal.

L. J. Mackey, manager at Erie, Pa., has resigned to accept the position of assistant to the president of Franklin *Evening News*, Franklin, Pa. He will have general charge of that publication. Mr. Mackey entered the Postal service as messenger, September 8, 1886, and after serving an eight-months apprenticeship was employed in various broker positions until March 17, 1890, when he was appointed manager of the Franklin office by General Superintendent, J. H. Emerick. On February 20, 1911, Mr. Mackey was appointed chief clerk to Superintendent H. Scrivens at Pittsburgh and on September 26, 1916, was appointed manager at Erie, Pa. For many years Mr. Mackey acted as agent for TELEGRAPH AND TELEPHONE AGE. His methods of doing business, coupled with his enterprise, eminently qualify him to fulfill the duties of his new position. In leaving the service of the Postal Company, Mr. Mackey does so with much regret and he states that his success is largely due to the friendly and able tutorship of Superintendent Scrivens.

Los Angeles Western Union.

S. D. Barger, one of our branch office managers, has been added to the traffic department in the main office.

I. D. Hough, Jr., late of this office has accepted a position in Tucson, Ariz. Mr. Hough is the son of I. D. Hough of Dallas, Tex., a well known local telegraph official at that point.

St. Louis Western Union.

At the meeting of the Western Union Electrical Society, held in Assembly Hall, Public Library, Thursday evening, May 17, Dr. E. Lee Myers, an ex-telegrapher, personally known to many of the members, and now a practising physician of this city, addressed the meeting, his subject being. "The Influence of Elecricity in Medicine; and its Benefits to the Human System." Dr. Myers handled the subject in an entertaining and instructive manner, and his address was enjoyed by the members and their friends who attended.

Messrs. F. E. Meinholtz and R. J. Julian, managers of two branch offices in the down town district, have joined the Naval Radio Corps, and have gone to the naval training station, at Great Lakes, Ill., for training.

Pittsburgh Western Union.

C. H. Simpson, formerly manager of the Springfield, Mass., office, who was granted leave of absence last January on account of ill health has entirely recovered and has been appointed manager of this company's office at Charleston, W. Va., where he will have the opportunity to display his well known enterprise. Charleston is a thriving city of 50,000 inhabitants and growing very rapidly. The government is locating one of its great armor plate mills at this point which means much for the city and telegraphically it is a very important center.

Telegraph and Radio Operators, Electricians and Linemen, wanted for Signal Corps, U. S. Army. Pay ranges, according to rank and service, home or foreign, from $15 to $90 a month, and in addition rations, quarters, clothing and medical attendance are furnished. Signal Corps offers unusual opportunities for foreign service and rapid promotion to young men of character, intelligence and ability, who have had electrical training, particularly as telegraph or radio operators. For detailed information write to Chief Signal Officer, U. S. Army, Washington, D. C.

32d YEAR

Serial Building Loan and Savings Institution

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Vice-President, Thomas M. Brennan
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Reserve Fund - - - - $35,000

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Saturdays 1 p. m.

Rubber Telegraph Key Knobs.

No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fit snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. Address orders to TELEGAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York.

Telegraph and Telephone Age

No. 12. NEW YORK, JUNE 16, 1917. Thirty-fifth Year

Telegraph and Telephone Age

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REMITTANCES to TELEGRAPH AND TELEPHONE AGE should be made invariably by draft on New York, postal or express money-order, and never by cash loosely enclosed in an envelope. By the latter method money is liable to be lost, and if so remitted is at the risk of the sender.

ANY NEWSDEALER in the United States or Canada can obtain copies of TELEGRAPH AND TELEPHONE AGE through the American News Company, New York.

BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, JUNE 16, 1917.

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An Honorable and Successful Career.

With our June 1 issue the thirty-fifth year of this paper's existence began. Its purpose from the start was to instruct and elevate the telegraph fraternity, and it still is, and how well it has succeeded in doing this thousands of employes throughout the country, who have followed it, can testify.

While the paper has been faithful to its trust during all these years its path has not been altogether one strewn with roses. It has had its thorns and still encounters them. From the outside all sorts of obstacles have had to be met and overcome and in these latter-days the struggle for existence is greater than ever. Newspaper life was comparatively easy when the paper first saw light on June 1, 1883. Now things are vastly different. The white printing paper alone costs us 135 per cent. more than it did then; the printer's bills are double and Congress is trying to add to the burdens of newspapers by greatly increasing the postage rates, besides levying a tax on advertising matter.

The law prohibits newspapers from giving away any free copies, and we have been notified several times lately that if we publish any intoxicating liquor advertisements our paper will be excluded from the mails. This latter, however, is the least of our troubles, and does not worry us a bit, for we never have carried such advertisements.

Altogether these difficulties are large ones, but they have been met or will be met to the best of our ability. We cannot have so many fine limousines and fast yachts as we have been accustomed to, but our spirit is undaunted.

This publication has weathered the storms of two general strikes among commercial telegraphers—in 1883 and 1907—and it has survived several financial panics, and is still living its life of usefulness to the fraternity.

The management of the paper has been in the same hands during its entire existence, and what we are most proud of is the fact that we have showed thousands of telegraph men how to become more valuable to themselves, to the companies they work for, to their families and to the communities in which they live. The resulting feeling of satisfaction is our reward.

Some people's idea of reward is based on dollars and cents, but there is a higher compensation in the knowledge that one has helped others to attain to some degree the desirable things of life.

Special Payments to Employes.

The action of the directors of the Western Union Telegraph Company in voting two special payments to the employes this year to enable them to meet the high cost of living is highly commendable. It will cost the company a large amount of money, but its business is very great and it has found by experience that it pays to look after the interests of its employes as well as of its stockholders.

Never before have telegraph employes enjoyed the favor of the company as they do at present and it augurs well for the future maintenance of the existing harmonious relations between the two parties.

We congratulate the beneficiaries of this liberality on the part of the company and we hope that it will materially lighten the economic burden which rests so heavily upon them, as it does upon all of us.

Canceling Conventions not Favored.

Many organizations which hold annual conventions have cancelled their meetings this year on account of the war conditions and others are considering doing likewise. The movement has called forth the suggestion from the Merchants' Association of New York that they ought not be cancelled, because these gatherings are more necessary and advantageous now than at any other time. These meetings, the Association states, afford an opportunity for the interchange of ideas and the promotion of patriotic sentiment, which must prove of the greatest value to the country at this time.

President Wilson has been asked to discourage the postponement of conventions.

A Peep Into the Future.

Many people believe that the telephone will have met its ultimate limit of application and usefulness when every home and business house is thereby connected. We do not share this opinion. We have come to the conclusion after witnessing the marvelous advancement in the development and application of electricity in late years that there is no limit to progress.

If finality should ever be reached in anything it would mean that there is a limit to material progress, but such an admission in these enlightened days is inconceivable.

The telegraph, the telephone, cable telegraphy, wireless, etc., are all capable of vast expansion; it requires a genius to reveal the possibilities, that is all. All of these utilities have been developed to a high degree, but none is perfect, and so long as there is a possibility of getting nearer to perfection, so long will men strive for the reward.

One of the possibilities of the telephone and wireless combined will be a pocket instrument which will enable any one, wherever he may be, to place himself in communication with a central source of information by simply applying the telephone to his mouth and ear. Any kind of information will thus be obtainable. This accomplishment has been hinted at by foreign scientists and while we have no belief that it is impending it suggests that the idea having entered the mind of man may develop into a reality some day.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on June 12:

American Tel. and Tel. Co.	121⅞
Mackay Companies	80¼-85
Mackay Companies, pfd.	64-65
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2⅜
Western Union	94¼

Mr. Frank I. Fitch of the Central Cable Office, New York, in remitting to cover his subscription for another year writes: "Expiration dates come around fast these days but the AGE not fast enough."

Telegraph and Telephone Patents.

ISSUED MAY 8.

1,225,291. Telephone System. To F. Ward, G. H. Bryant and T. Inman, London, England.

1,225,463. Mouthpiece for Telephones and the Like. To J. T. McGonigal, Potterdale, Pa.

1,225,603. Measured Service Telephone System. To J. Erickson, Chicago, Ill.

1,225,672. Telephone Transmitter and Mouthpiece. To H. Nakai, Havre, Mont.

ISSUED MAY 15, 1917.

1,226,099. Transmitting Apparatus for Use in Wireless Telegraphy and Telephony. To G. Marconi, New York.

1,226,157. Combined Telephone and Signaling System. To C. S. Winston, Chicago.

1,226,166. Receiver Support for Telephones. To B. Badanes, New York.

ISSUED MAY 22.

1,226,775. Telegraph Sounder. To R. Koenig, Newburg, Wis.

1,226,886. Telephone Transmitter. To N. H. Holland, West Orange, N. J.

1,226,966. Telephone System and Apparatus. To B. Badanes, New York.

1,226,981. Telephone Call Registering System. To A. E. Lundell and H. G. Eddy, New York.

1,227,010. Telephone Exchange System. To E. H. Smythe, New York.

Reissue 13,304. Relay and Repeater. To W. Finn, New York.

PERSONAL.

MR. P. B. DELANY, of South Orange, N. J., will occupy his Nantucket, Mass., home until the fall.

MR. GEO. D. PERRY, general manager of the Great NorthWestern Telegraph Company, Toronto, Ont., was a recent New York visitor.

MR. G. W. HICKEY, a well-known old-time telegrapher, who some years ago retired from active service, has taken up his residence in Bethlehem, N. H., for the summer.

MR. W. C. HUMSTONE, formerly superintendent of the Western Union Telegraph Company, New York, who retired from the telegraph service in 1902, has taken up his residence at Pittsfield, Mass., for the summer months.

MR. L. W. WORTSMAN, of Savannah, Ga., a well-known old-time telegrapher and a member of the United States Military Telegraph Corps during the Civil War, is directing the preliminary work of organizing a Signal Reserve Corps in Savannah. This corps is open for the enlistment of any telegrapher, telephonist, radio operator or anyone else versed in electric signaling.

MR. WALTER P. PHILLIPS, who has been in Florida since February, has returned to New York. He stopped at several places, including Chicago, Louisville and Washington, while returning to the city. He visited many of his old-time telegraph and newspaper friends at his several stopping places, all of whom extended him a cordial welcome and, judging by the newspaper notices we received, his receptions assumed the nature of a "home coming."

Mr. Phillips will spend the summer at Oak Bluffs, Mass.

"OLD FARMER" LAWTON VISITS NEW YORK.—Among recent New York visitors were Mr. George E. Lawton, better known as "Old Farmer" Lawton, formerly and for many years assistant manager of the Western Union Telegraph Company at Denver, Col., who retired from active service three years ago, since which time he has been residing on his farm at Plymouth, Ill. His presence in the city was soon known and many of the Metropolitan newspaper men went gunning for him. They had all at one time or another been entertained by the "Old Farmer" during sojourns in Denver and they evidently thought it would be only right to make the Farmer's visit to New York pleasant. However, this was not to be, as the "Old Farmer" remained in the city just twenty-four hours when business in Washington demanded his presence there. He then returned to his farm at Plymouth, Ill., where he is busy trying to reduce the high cost of living by raising bumper crops.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

MESSRS. G. W. RIBBLE, general superintendent, W. C. Daviet, superintendent, and B. S. Price, superintendent of construction, of Atlanta, Ga., were in Florida recently looking over the situation with a view to improvements and the building of new lines.

MR. V. V. STEVENSON has been appointed superintendent of the third district, Pacific Division, with headquarters at Los Angeles, Cal., vice C. L. Lewis, resigned.

DIVIDEND.—The Mackay Companies on May 22 declared the regular quarterly dividend of 1½ per cent. on the common stock and 1 per cent. on the preferred.

MANAGERS APPOINTED.—H. F. Fuller, at Orrville, Ohio; A. J. Wammes, Piqua, Ohio; J. H. Livingston, Lexington, N. C.; J. P. Lewis, Reidsville, N. C.; J. P. Johnson, Greenville, N. C.; G. E. Widel, Franklin, Pa.; T. C. Dunn, Dodge City, Kan.; D. R. Sandford, De Land, Fla.; T. Rose, Redding, Cal.; Fred Lewis, Barstow, Cal.; L. M. Welch, Michigan City, Ind.; Miss Lydia M. Gross, Beloit, Wis.; J. H. Keown, Hannibal, Mo.

LIBERTY BONDS.—The Mutual Credit Union of the Postal Telegraph-Cable Company has announced through its president, Mr. Edward Reynolds, who is also vice-president and general manager of the Postal Telegraph-Cable Company, that it has arranged to purchase Liberty Loan bonds for the employes of the company, to be paid for on the partial payment plan, it being understood that interest is to be paid to purchasers on the partial payments from the date payments are received at the rate of three and one-half per cent. per annum, no charge to be made to the purchaser for money advanced for the purchase of bonds. Under this plan, the yield to the buyer is seven per cent. A large number of bonds have been subscribed for.

Mutual Investment Credit Union, of the Postal Telegraph-Cable Company.

On February 1, 1910, a voluntary association was formed among the employes of the Postal Telegraph-Cable Company to promote the cultivation of habits of thrift among their number. Its results exceeded the expectations of those who conceived the plan and aided in the formation of the association. It was an informal movement but it met the needs of those it was created to serve from the start. It began without any paid in capital, except a few small deposits by the original charter members. The entire capital afterwards developed was secured through deposits by its members, plus earned profits. The underlying idea of the association was to assist fellow employes in time of financial stress with small loans without delay and without embarrassment.

This association was one of the first to adopt the practice of making character loans, instead of requiring a pledge of personal property. A good character was the only collateral it asked. The idea of small character loans to wage earners has since been taken up by other concerns and capitalized.

The work of the Mutual Investment Association soon attracted the notice of outside associations whose business it is to study remedial loan organizations. The Russell Sage Foundation in particular, after a careful study of the work of the Mutual Investment Association, introduced a banking law in the New York legislature to simplify the forming of similar organizations and to protect the depositors therein, so as to widen the field for such work as the Mutual association was doing. This was a compliment to the work of the old Mutual Investment Association! The legislature passed what is known as a "Credit Union" law, under the banking act.

In the early part of 1915 the superintendent of the Banking Department of the State of New York suggested that the association be incorporated as a "credit union." In order to bring about this change in the character of the organization, it was necessary to liquidate the original association, by distributing its assets to the individual members. This was done at the close of its sixth year, on January 31, 1915, each member being paid his full share.

To show what can be gained through the united efforts of numbers, this simple voluntary association of employes gathered together a sum of money amounting to $64,749.42. This amount was distributed pro rata to the members.

Beginning February 1, 1915, the Mutual Investment Credit Union took up the work of the old Mutual Investment Association, with an initial capital of $2,000 which had to be borrowed. It has since repaid the loan secured to start it on its way, and the figures in the balance sheet below, showing its assets and liabilities as of May 21, 1917, (representing the first twenty-eight months' experience of the new Credit Union) are a gratifying exhibit of thrift on the part of the employes of the Postal Telegraph-Cable Company in the City of New York.

ASSETS

Balance Sheet as of May 21, 1917.

Cash on hand and in Bank	$2,130.36
Loans Outstanding	29,542.32
	$31,672.68

LIABILITIES

Shares Fully Paid	$11,852.00
Shares, Instalments	12,205.76
Christmas Savings	2,993.76
Reserve Fund	4,093.02
Accounts Payable	528.14
	$31,672.68

These figures only show the amount of cash deposited with the Credit Union as a savings fund, but the association has assisted the employes of the company in various ways. It has saved them large sums of money in the purchase of clothing and household supplies; it has been of value in acting as a depository for temporary funds, such as Christmas savings funds. It has now taken up the patriotic work of assisting in the floating of the "Liberty Loan" bonds, as was announced in our June 1 issue.

The headquarters of the Mutual Investment Credit Union are located at 253 Broadway, New York City. The officers are Edward Reynolds, president; Welcome I. Capen, vice-president; F. J. Kernan, secretary and treasurer.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Two Special Payments for Employes.—The directors of this company on June 5 voted to give the regular employes two special payments this year to meet the high cost of living, similar to the extra compensation distributed December 5, last year. The two payments will be made July 1, 1917, and January 1, 1918, or as soon thereafter as practicable, to each regular employe, excepting the president of the company and such cable employes as have received special payments during the year. All messengers at independent offices will receive a flat sum of $25.00—$12.50 on July 1, and $12.50 on January 1, 1918; employes receiving less than $1,200 per annum will get 8% of their annual wages—4% on July 1 and 4% on January 1, 1918; employes receiving from $1,200 to $1,999.99, both inclusive, 6%—3% July 1 and 3% January 1, 1918, with a minimum of $50.00, and those receiving $2,000 and more, 5%—2½% July 1 and 2½% January 1, 1918, with a minimum of $65.00.

Dividend.—The directors of this company declared the regular quarterly dividend of 1½ per cent. on June 5.

New Offices Opened.—The new office at Cleveland, Ohio, was cut over on May 19-20 and that at Minneapolis, Minn., on May 5.

Mr. William Finn of the electrical engineer's office, New York, who has been in California for the past month, has returned to the city accompanied by Mrs. Finn, who spent eight months in the Golden State where several members of their family reside.

Mr. H. B. Gale, well known in Texas, has been appointed manager of the Jerome, Ariz., office of this company.

Mr. C. C. Maxson, who was recently transferred from the chief operatorship of the Helena, Mont., office to San Francisco, where he was appointed assistant chief operator in charge of the multiplex department, has been transferred to New York, where he has been assigned to duty in the plant layout and routing department of Vice-President Fashbaugh's office.

Mr. C. E. Winn, of the office of Division Plant Superintendent M. B. Wyrick, Chicago, who has been in New York for the past two weeks on special work in the engineering department, under P. J. Howe, has returned to Chicago.

Several Young Graduates from the engineering colleges will be taken on in the engineering department of this company.

Unrepeated Telegram Rate Decision.—The Interstate Commerce Commission on June 4 dismissed the complaint of the Clay County Produce Company, Clay Center, Kan., against the Western Union Telegraph Company, approving the telegraph company's unrepeated rate and the restriction attached thereto. In the case in question the "unrepeated" telegram was garbled in transmission and the sale of a carload of poultry and kindred products was involved. The Commission holds that the telegraph company was not liable for damages.

New Main Office at Chicago.

This company has purchased a location for a new office on South LaSalle Street, Chicago, and will erect the most complete telegraph building in the country. The plot is 300 feet by 101 feet and was purchased from the estate of Marshall Field. A six-story and basement steel structure will be erected and it will be of sufficient strength to carry additional stories. The operating room will be of larger area than any in the country and the employes will be provided with generous rest rooms and quarters. There will be two playgrounds on the roof, each approximately 5,000 square feet in area, one for men and the other for women employes. The messengers will be furnished with club rooms, shower baths, etc. It is needless to say that the equipment of the new building will be up to date in every particular.

In view of the prevalence of smoke in Chicago it is planned to install a ventilating system in the building whereby all air admitted to the rooms will be washed and of the proper temperature.

The part of the basement not assigned to machinery for the operation of the building, and the pneumatic service, will be used as a warehouse for the company's supplies for the district of Chicago. The rear of the building will be designed to facilitate the handling of supplies and there will be a garage for the company's motor trucks.

It is expected that the new quarters will be ready for occupancy in about eighteen months.

Traffic Field Inspections.

BY LOUIS CASPER, TRAFFIC SUPERVISOR, WESTERN UNION TELEGRAPH COMPANY, NEW YORK

In so great a system as that of the Western Union, operating 150 automatic printing telegraph circuits, over 700 quadruplexes and duplexes, and hundreds of single Morse lines, a highly developed method of supervision is required, embracing detailed local inspections by resident supervisors and general inspections for the purpose of comparing and correlating local conditions.

The organization with respect to inspections is centered in New York and is sub-divided territorially according to the usual traffic divisions.

The field inspectors are picked men, generally of wide experience and technical training, temperamentally fitted for their duties. Much depends upon the accuracy and fairness of their reports, which cover all phases of traffic operation and maintenance. These reports furnish the basis of valuable data and information for the use of the headquarters staff.

A few of the specific matters of inspection are: Regulating apparatus; testboard operation; checking up of records; maintenance of routines issued by the department; speed of service; arrangement and assignment of circuits; regular and emergency power plants; power and lighting current consumption records; lighting, heating, ventilation and sanitation of offices.

An important phase of the general office inspector's work is that of making observations and studies relative to the efficiency of circuits from an inter-divisional standpoint. There are times when it becomes necessary to examine the conditions of a circuit from end to end. Such a circuit may pass through several divisions. By extensive observations the general office inspector is enabled to arrive at more definite conclusions as to the cause or causes of the troublesome condition than would be possible from an analysis of divisional reports alone.

The inspector's work is co-operative. The visit of an inspector is not regarded as a matter of trepidation, but as a welcome stimulus. There are many perplexing matters which the inspector can clarify, either by suggestions based upon his broader experience, or by practical demonstration. He also endeavors to vitalize and illumine the intent and purposes of all communications and instructions emanating from the general offices. His entire attitude is to invite the confidence and friendship of the men with whom he comes in contact, and by his interest and initiative help to instill enthusiasm and advance the development of team-work.

A New Duty for Telegraph Companies.

A customer recently entered a telegraph office and stated that he wished not only to send a contribution of flowers to show his esteem for a dead friend, at a distant point, but he wished the company would have one of its employes represent him at the funeral services by his presence, dressed in black clothes, including a black crepe necktie.

THE CABLE.

Mr. F. H. Waycott, manager of the Anglo-American Telegraph Company's office at Montreal, Que., was in New York recently to attend the graduation exercises of his son at Columbia University.

The Commercial Cable Company has just issued, in pamphlet form, additions and corrections to the book of cable rates, 1915.

The Legal Time in Newfoundland was advanced one hour on June 10.

Multiplexing in Cable Telegraphy.

Brigadier-General George O. Squier, Chief Signal Officer of the United States Army, who has done so much excellent work in high-speed telegraphy, gives, in the May number of the *Journal of the Franklin Institute,* a brief description of a method of multiplexing submarine telegraph cables. He uses alternating currents for the purpose, and proposes to employ separate cables for sending and receiving, transmitting several messages on one cable and receiving a corresponding number on another. This method, he thinks, offers the best solution of the problem where the volume of traffic warrants. In such an arrangement the artificial cable is eliminated and at the same time troubles incidental to the accurate balancing of the bridge duplex are gotten rid of.

Cable Interruptions.

Interruption to submarine telegraph cables are reported to May 26, as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable) October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917.

CANADIAN NOTES.

GREAT NORTH WESTERN

Mr. W. T. Leslie, formerly chief operator of the Quebec office, has been advanced to the management at the same point, vice R. V. Aubin deceased.

F. N. Kiefer of the Canadian Pacific Railway Company's Telegraphs, Winnipeg, Man., was a New York City visitor this week, calling on many of his old friends. Mr. Kiefer was formerly a resident of New York.

THE TELEPHONE.

Farmer Telephone Employes.—Judging from the pictures in the telephone journals all of the telephone employes not in the government service have become farmers and farmerettes. If they are not carrying guns they are carrying hoes and rakes.

New York Telephone Company has made arrangements to enable its employes to purchase through it Liberty Loan Bonds on the instalment plan. The company will deduct from the employes' pay $1.00 each week for fifty successive weeks, in the case of employes who are paid weekly, and $5.00 each per month for the months of June, 1917, and May, 1918, and $4.00 each intervening month, in the case of employes who are paid by the month or semi-monthly.

LARGE TELEPHONE CABLE.—The New York Telephone Company has completed the work of laying a large submarine telephone cable across Raritan Bay, between Eltingville, S. I., and Keansburg, N. J., a distance of nearly 5½ miles. It is said to be the longest maximum size duplex submarine telephone cable at the present time. It contains seventy-four pairs of wires for regular telephone work and twelve pairs for testing purposes.

Major J. J. Carty Head of a Small Army.

The many friends of Major J. J. Carty, of the Signal Corps Reserve, will be glad to look upon him in his military uniform. Major Carty is the chief engineer of the American Telephone and Telegraph Company, and his vast experience in this position will become very valuable indeed in his new duties for "Uncle Sam." The Bell telephone companies will form twenty-five signal corps reserve companies, each company to be made up of one captain, two first lieutenants and an average of about one hundred non-commissioned officers and men, with one major and an extra lieutenant for each two companies, a total of about one hundred officers and 2,500 non-commissioned officers and men.

MAJOR J. J. CARTY.

Punishment for Abusive Language Over Telephone.

M. M. Frankel, editor of a paper published in New York, was cut off from telephone service at his home and office by the New York Telephone Company several months ago for abusive language to the operators. The New York Public Service Commission sustained this action of the telephone company. Mrs. Frankel recently petitioned the commission to restore the telephone at her home in Spring Valley, N. Y., for her personal use. Her request was granted but she had to solemnly promise that her husband should not go near the telephone.

National Distribution of News by Telephone.

The telephone's importance in the newspaper world is not confined to the gathering of local news alone, because it performs some very efficient duties in the national distribution of news, says Charles Speaks in *The Telephone Review*. Here's an example:

A few minutes after the action of the United States in breaking diplomatic relations with Germany was announced, hundreds of editors or their assistants in the smaller cities were "taking down" the President's speech as it was read to them over the telephone from a press association bureau in some large nearby city.

A few minutes more and the news was on the first pages of all these small dailies. More than 1,000,000 people in this way were getting practically as complete information about the event as the readers of the biggest daily papers in the large cities. And it is the telephone that has made it possible for readers of small city daily papers to have the latest news while it is "hot."

Through the medium of the local and long distance lines of the Bell System the three big news gathering organizations—the Associated Press, the International News Service and the United Press—serve daily about five hundred small newspapers. The news received by these small papers is "news," too, not accounts of events several days old. Before the use of the telephone as a medium for the transmission of what in newspaper parlance is known as "telegraph news" there were not many small city dailies that could give their readers every day items from all parts of the world about events which had occurred that very day.

RADIO TELEGRAPHY.

MR. WILLIAM MARCONI, who is in this country in connection with the Italian war commission, was presented with the honorary degree of Doctor of Science by Columbia University on June 6.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager, and Mr. David Sarnoff, commercial manager, have returned from Washington where they went on business of the company.

Mr. Geo. S. De Sousa, traffic manager, New York, is en route to San Francisco where he will remain for some time in charge of the Marconi business on the Pacific Coast, relieving Mr. W. A. Winterbottom, who returns to the executive offices, New York, Superintendent T. M. Stevens having joined the colors. Before leaving, Mr. De Sousa was given a complimentary informal luncheon which was attended by all of the heads of departments.

The extension which is being added to the Marconi factory at Aldene, N. J., is nearly completed and a portion of it is already in service.

Mr. F. H. Mason, superintendent, Cleveland, Ohio, having joined the colors, Mr. E. A. Nicholas has been appointed acting superintendent.

Mr. J. A. Pohl, superintendent, New Orleans, La., having been called to the Navy Department on special service is succeeded by Mr. G. E. Henderson, acting superintendent.

NAVAL COMMUNICATION SERVICE NOTES.

The office of the director of naval communications has been removed from Radio, Va., to the Southern Building, Washington, D. C. The administration building at Radio has been turned into a residence for the officer in charge of the Washington (Arlington) radio station.

The Navy Department has authorized various bookkeeping clerical positions to be filled under civil service rules in the office of the director of naval communications. These positions are now being held by enlisted men of the navy. The work involves accounting for radio, telegraph and cable traffic handled throughout the world. Application should be made to the U. S. Civil Service Commission.

Mr. Arthur A. Isbell, formerly with the Marconi Wireless Telegraph Company of America at San Francisco, has been appointed expert radio aid in the Navy Department.

Mr. Chas. J. Pannill, commercial superintendent, has returned to Washington after an inspection of the Great Lakes radio stations taken over by his department.

Electric Waves.

Professor Wm. S. Franklin of Lehigh University, Bethlehem, Pa., gave an illustrated lecture on "Electric Waves" before a joint meeting of the Chicago Section, American Institute of Electrical Engineers, and the Electrical Section, Western Society of Engineers, in Chicago, May 28. He showed the fundamental relations of the transmission of electric waves and their similarity to waves in a string or other medium.

Convention of Rotary Clubs.

The telegraph section of the International Association of Rotary Clubs will be held in Atlanta, Ga., June 19. Mr. H. C. Worthen, general manager, Southern Division, Western Union Telegraph Company will make an informal address on the subject "Telegraph Service in War Time," and Mr. B. F. Ragsdale, district commercial superintendent, Western Union Telegraph Company, Atlanta, will make the address of welcome. There will be a general discussion on the subject "What can our Vocation do Best to Help During the War." Mr. W. C. Carswell, manager, Western Union Telegraph Company, Topeka, Kan., is chairman of the telegraph section.

Convention of the American Institute of Electrical Engineers Cancelled.

The annual convention of the American Institute of Electrical Engineers, which was to have been held at Hot Springs, Va., during the present month, has been cancelled on account of the national situation. Instead of the convention a special meeting will be held in New York, June 27 and 28, when the papers which were to have been presented at the annual convention will be presented and discussed.

Associated Press Operators in Signal Service.

Mr. Melville E. Stone, general manager of the Associated Press, has suggested to those of his operators who are likely to be called upon for government service that they join the signal corps.

TELEGRAPH AND TELEPHONE INSPECTOR.—A competitive examination for telegraph and telephone inspector will be held July 17 at the usual places to fill this position in the United States Civil Service Commission. The salary ranges from $1,200 to $1,800 per annum.

A CORRECTION.—In handling the forms of the June 1 issue of this journal for the press a line was displaced at the top of the first column of page 242 and inserted at the bottom of the next column. The line was from the quotation of Thomas Jefferson in regard to the importance of newspapers, and as the quotation is meaningless the way it appeared, we give it here in order to show what that great man's opinion was of the press in this country. He said, "Were it left to me to decide whether we should have a government without newspapers, or newspapers without a government, I should not hesitate to prefer the latter."

OBITUARY

ARTHUR W. COPP, aged forty-nine years, superintendent of the Southern Division of the Associated Press, died at Washington, June 12. He was well known on the Pacific Coast. He was an excellent telegraph man and he acted as San Francisco representative of TELEGRAPH AND TELEPHONE AGE for a number of years.

JAMES R. COBOURN, aged seventy-six years, manager of the Western Union Company's office at Paducah, Ky., for thirty-one years, died in that place May 5. Mr. Cobourn had been with the company for forty-five years and was a veteran of the Confederate Army in the Civil War.

WILLIAM H. STONE, who for nearly fifty years has been foreign telegraph adviser of the Japanese Government, died in Tokio on June 3, from cancer of the lungs. Mr. Stone was born in England. He went to Japan in the early 70's with the pioneers who introduced telegraphy in Japan and has rendered valuable assistance to that Government in developing this means of communication. He has received several decorations in recognition of his good work and before his death the Emperor of Japan conferred upon him the Grand Cordon of the Order of the Rising Sun for his long and honorable services to the Japanese Government.

Views of Telephone and Telegraph Building at 195 Broadway, New York.

The accompanying illustrations give three views of some of the features of the Telephone and Telegraph Building at 195 Broadway, New York. This building, as has already been stated, is one of the finest examples of modern architecture to be found in the country.

The feature of the building which attracts the most attention and admiration from the public is the ground floor. This is a chamber of vast proportions and resembles a modern railway station in a large city. The columns are massive and the general design and arrangement suggest an ancient temple. The entire room—walls, floors, columns and other features—is finished in a light-colored marble which is pleasing and restful to the eye.

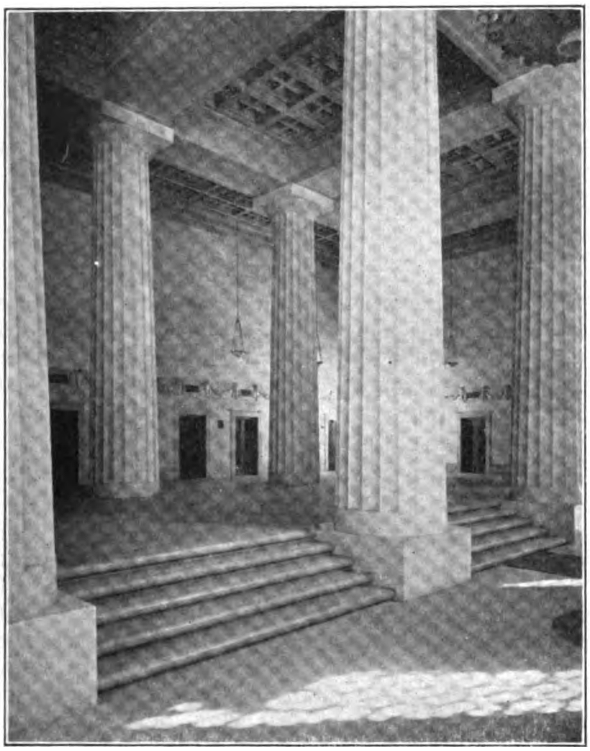


FIG. 1—MAIN LOBBY.

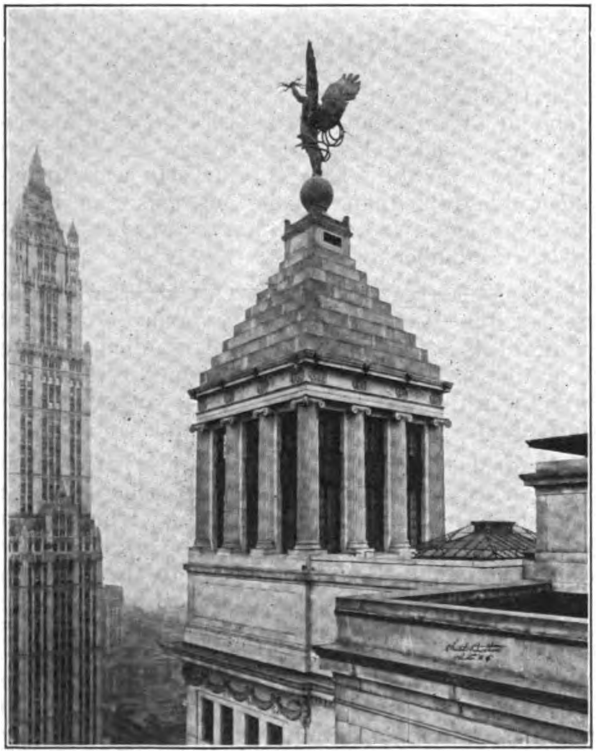


FIG. 3—VIEW OF STATUE OF ELECTRICITY.

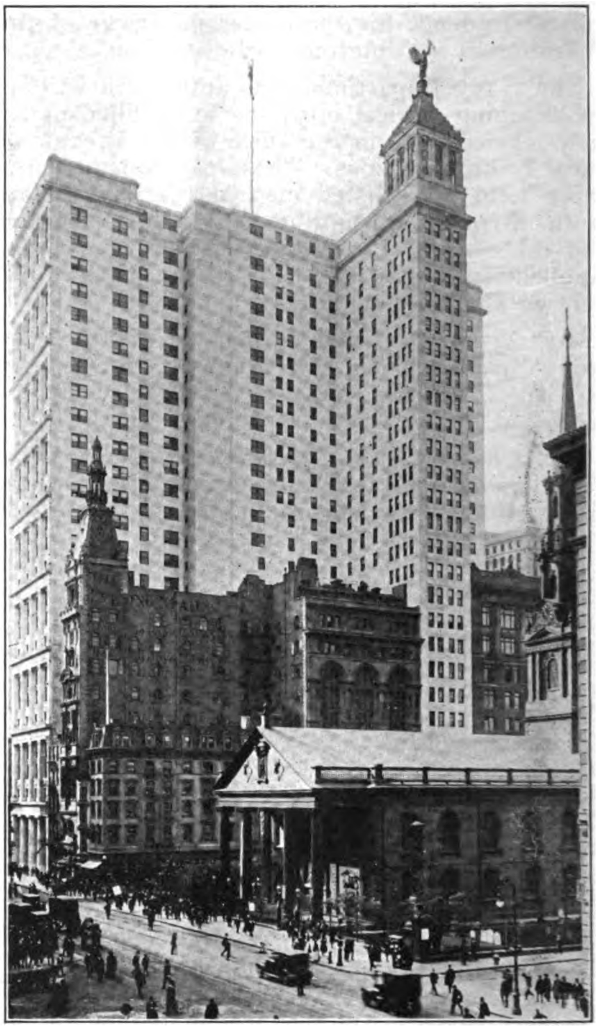


FIG. 2—VIEW OF BUILDING FROM PARK ROW.

Fig. 1 gives a view of the main lobby around the entrances to the elevators, some of which are seen in the background.

Fig. 2 gives an external view of the building as seen from Park Row. The statue of Electricity surmounting the tower of the Fulton Street wing is plainly seen, and a more detailed view of the statue is shown in Fig. 3.

These illustrations are given through the courtesy of the *Western Electric News.*

The Mysterious "C. B. X."

BY R. M. TELSCHOW, NEW YORK (*Copyright*)

Flushed and radiant, Hazard Brown entered the library where his father sat reading.

"Well, Hazard," said the old gentleman, "I can tell by your face that you've had a wonderful adventure you are eager to tell about."

"No, father," replied the young wireless enthusiast, who had "cut out" his set for the night, "I've merely had my usual evening chat with 'C. B. X.'" I am on edge over a statement made by my unknown wireless friend that I've been holding nightly aerial pow-wows with a young woman, rather than the electrical wizard I had confidently pictured. In fact, our conversations are becoming less scientific and more sentimental. Did you ever encounter a similar experience in your years of telegraph service, father?"

Mr. Brown hesitated a moment in deep thought, and then looked at the boy and smiled.

"Yes," he admitted, rather reluctantly it seemed, "I once had an experience of a similar nature and it is only with the hope that it may preserve your mental tranquillity that I consent to speak of it."

"I was about twenty-three years of age when I began work for the Central Air Line Railroad," began the ex-telegrapher, now the sedate, dignified cashier of the Milltown National Bank.

"I worked at an important junction point, and as a rule had plenty of work to do. One day, after I transmitted a message to 'X,' our division office, operator 'Hd,' who had received the message, began a conversation upon a topic of current interest. I found myself carried away by the agreeable chatter of 'Hd' and rather looked forward with pleasure to a continuance of the friendship. After several months 'Hd' confided to me that my remarks had been addressed to a young lady and that she was beginning to nurture a stronger sentiment than mere friendship toward me. I was not only astonished but felt greatly flattered at this frank confession, and assured the young woman that I felt honored and reciprocated her feelings. She told me her name was Helen Dunton and she would be delighted to exchange photographs with me.

"Besides our daily five o'clock tête-a-tête over the wire a mail correspondence sprang up. She sent me her picture as promised. I had never beheld so fair a creature. I vowed I would win and marry her. To use modern vernacular, I was 'clean plumb daffy' over the girl. My working hours were spent in planning a little rose-bowered cottage where she and I would spend the rest of our days in bliss. Once my day-dreaming came near causing the collision of two trains head-on. By night I lay awake for hours picturing my fair lady and mentally figuring how many days must elapse before I might clasp her in my arms.

"There were five other operators at 'X,' all of whom spoke of Helen in glowing terms. One even went so far as to challenge my right to her affections. Finally, unable to cope longer with the nervous strain, and togged out as befitted a gay young Lothario, I strutted forth one fine morning to take the first train for 'X.' I felt, I imagine, like Don Quixote when he ventured forth to do battle with windmills, though I did not suffer the discomfort of traveling atop a bony Rosinante. On the contrary, I lolled back in solid comfort against the plush cushions of the railway coach and dreamed over and over again the happy conversations on that dear old iron wire number seventeen.

"My trip proved a bitter disappointment. Upon knocking on the door of the office, a portly gentleman opened the door and informed me he was 'Bob' Truitt, the chief operator. I introduced myself and asked permission to see Miss Helen Dunton. To my dismay, he informed me that Miss Dunton had been obliged to attend the funeral of a relative in another city and was not expected to return to the office for several days.

"I found Bob such an agreeable fellow that I invited him out with me that afternoon. We spent the evening about the city and in a burst of confidence the chief operator told me I was a lucky chap to win the love of a beautiful girl like Helen. He said she was a winsome, amiable young woman of good family, and whispered that she would eventually inherit a considerable fortune. I returned home firmly resolved that Helen Dunton must become the future Mrs. Brown."

The old gentleman sat back in his chair and indulged in a quiet chuckle. Ever notice what a cheering, soothing effect old love reminiscences have upon people who have passed beyond the treacherous sentimental whirlpools of youth?

"Finish the story, dad," said Hazard. "I'm eager to hear the denouement. She must have been wonderfully pretty."

"There isn't much left to tell," quoth Mr. Brown. Several weeks passed before I ventured upon another visit to 'X.' This time I was more fortunate. The object of my quest was in. I had previously announced my intention of coming over, and Bob Truitt beamed with good nature as he led me within the sacred portals of the telegraph office and introduced me to the boys.

"Where is she?" I inquired eagerly.

"'Oh, she's in that room,' said Bob, leading me to an ante-room.

"We entered. Seated at a desk was a young man who appeared to be very busy writing, but I couldn't see any young woman. 'Where is she, Bob,' I repeated; then I noticed that the young man's face had colored a deep crimson, and Bob said huskily, 'that's her' as he pointed to the young man.

"It was a terrible blow. I stood there gazing blankly at the young fellow, and ran my fingers nervously through my hair trying to find speech.

"'Mr. Brown,' Bob said, 'shake hands with Harry Dunton, the Helen of your dreams.'

"At first I was disposed to administer a severe rebuke to the operator who had fooled me so cleverly, but he offered an apology in such sincere words that I relented and grasped his extended hand, muttering forgiveness. Harry, choking with emotion, now for the first time realized the havoc he had wrought in my life, as I stood there trembling with mingled rage and grief. Dunton admitted he had sent a picture of his cousin, a pretty miss who had since become a bride. He had affected the penmanship of a woman in corresponding with me, and carefully saved the many little gifts I had sent from time to time, which he was ready to return to me.

"I confessed I was keenly disappointed, as I had been perfectly sincere in my courtship and had come with the avowed purpose of proposing honorable marriage. I decided to accept the situation philosophically, however, and endeavored to summon sufficient fortitude to try and forget it. That evening I was host at a little dinner party, my guests being the day operators of 'X' office. Harry Dunton tried in many ways to make amends for the miserable joke he had played upon me, and when he died several years later, had so far succeeded in his efforts that his untimely demise came as a great shock to me."

The old man lit a cigar and seemed lost in the maze of smoke clouds issuing from the fragrant leaf, perhaps there seeking in fancy the form of the friend of his youth. Hazard bade his father good-night, and passed through the great hall and upstairs to his chamber.

Fearing an incipient wireless romance Hazard Brown decided to profit by his father's narrative. One day shortly afterward, he slipped off unnoticed and unannounced appeared at number seventy-three Twilight Lane, Edendale, in quest of C. Bell. A kindly old woman informed the young man that if it was the electrician he was seeking the best place to find him was at his place of business on Main Street. Thither the young man bent his footsteps and soon found the electrical shop of Charles Bell. He stepped inside and without revealing his identity engaged in a conversation on wireless and other electrical subjects.

The amateur wireless stations conversed as usual that night, but somehow Hazard made only lukewarm responses to the "good evening, dear" and other pleasantries of the alleged little girl at the distant station. He wasn't taking any chances. His father's story had created a vivid impression and he refused to be hoaxed in a similar manner. Finally he became angry.

"Now see here," he flashed in steady, deliberate strokes on the wireless key, "this nonsense has got to stop. I've been over to Edendale and know who you are."

"That's news to me," came in the jerky little spurts which had once fascinated Hazard. "I do not remember having had the pleasure of meeting you, though I should like to very much."

"I was in your shop on May 14th and purchased some accessories for the making of an audion from you. You will recollect the tall young man whom you took such pains to instruct in the proper way to make one. Do you remember me now?"

"Ha! Ha!" twitched back the Edendale operator, "now I know you are mistaken."

"All right," Hazard fumbled excitedly and belligerently, "I shall come over again tomorrow and show you who I am."

"I will be delighted to see you," came the unruffled response from 'CBX,' "good night, honey boy!"

"Oh, go to the ———."

Hazard caught the sending lever in the nick of time. He was just about to say something ungentlemanly, but he decided he wouldn't. How many times in our lives is the truth brought home to us that there are times when silence is golden! Although Hazard felt justified in the light of his information, he regretted his haste and forebore any further recriminations against the imperturbable "CBX."

The following day young Brown took the early afternoon train for Edendale determined to fight it out personally with Charles Bell, electrician.

Arriving at the shop of Mr. Bell, little red devils of anger chased each other around the unforrowed features of Hazard Brown as he read the riot act to that worthy.

"Since you mention the circumstances so explicity, I now recall your previous visit," calmly remarked Mr. Bell, "but good heavens how was I to know you were the young wireless enthusiast my daughter has been talking about at breakfast, dinner and supper for a couple of months past!"

"Your daughter!" gasped Hazard.

That evening Charles Bell, electrician formally introduced Hazard Brown, of Milltown, to his daughter Miss Clara Bell, pretty young school teacher of Edendale, who wirelessed and dabbled in electrical phenomena from sheer love of science.

As Hazard glanced at the delicate lines of her graceful contour, and noted the tinge of color flit to her dimpled cheeks, he became conscious that he had acted in a very naughty manner the previous night. Furthermore, he decided he had no right to chide her if she cared to call him 'dear.' There is something distinctly uncanny in the way of a girl when she is viewed by a man magnetically receptive—the swish of each vagabond golden-brown curl as it furtively caressed the velvety pink and white expanse of facial rotundity; the sharp glint of roguish dark blue optics as they beamed now hither, now thither, full-focused, but a brief heavenly moment at a time on the willing subject of a hypnotic touchdown, the winsome smile whose translation under the gifted inspiration of youths spells the genesis of romance; all symptoms of the most wonderful thing in the world—love!

"Good night, dear," said Miss Bell at the railroad station, coyly pressing a smooth, white hand into his as Hazard was about to board a train for home later in the evening. "Shall I call you as usual tomorrow night?"

"Good night, little girl," voiced Hazard, feelingly, "I shall listen for your call at eight tomorrow night."

"Don't forget!" she shouted as the train started.

Settling back in his seat on the train, Hazard realized that he, at one and twenty, was a young man very much in love. And a certain young woman in Edendale, silently retracing her steps homeward with her father, clung convulsively to his arm, conscious of a mysterious upheaval within her bosom. Telepathic communication had supplanted wireless, and the alphabet of Morse gave way before the beautiful language of love.

Efficiency Engineering in the Telegraph Service.

(Continued from page 259, June 1)

The value of team work in perfecting service cannot be over-estimated. Team work means co-operation. This means that everyone should pull together for the best interest of the company. If this is accomplished service is the result, and service means pleased patrons and an increased business. Many officials are full to running over with pride and conceit and their puffed up mentality really works to their discredit. Some of them know it but cannot throw off the yoke that is injuring them, while others do not realize it until they have met with reverses. A few minutes' thought or retrospective view as to the causes of any misfortune that has overtaken them soon convinces that they are lacking in some ingredient in their make-up. The missing part may be charity. It is very likely so. When a man thinks he knows it all he has made a grievous error in judgment and he is to be pitied, and would be, if it were not for the harm that he unwittingly does to others. Some officials were never known to apologize for wrongs. Other officials are profuse in their apologies when they learn that an injustice was done someone on account of their hasty conclusions. Some persons believe in punishing people first and then try them afterwards to see if they are guilty or not guilty.

We all know that human beings are liable to error. When a man acknowledges that he made a mistake he naturally becomes big in the estimation of others. The presidents and general managers of our largest railroads have been carefully trained in the management of the company's affairs, yet they occasionally make ludicrous mistakes that cause subordinates to smile. The facts are no one is free from error in judgment. Therefore, the person who makes the fewest mistakes enjoys the reputation of being most accurate in his conclusions.

How often have we noticed the gradual disorganization of some large concern. Sometimes it has actually gone into bankruptcy. Then again we have observed that when a corporation appeared to be on the brink of dismemberment a sudden change brought the enterprise back to its proper sphere of usefulness. There is a reason for all this. Let us dig down for it. A new general manager was probably selected to manage an enterprise with which he was not familiar. Competitors took notice of the fact and twisted his every act to their own advantage. They made his path of duty one of thorns instead of roses. He merely hopped along the business thoroughfare and never landed anywhere. He was a victim of favor. When the change in management came, as it had to do sooner or later to keep the sheriff from taking possession of the property, a strong, broad-gauged man was selected to restore order out of chaos. He went about his work quietly, methodically and efficiently, with the result that in a very short time team work was noticeable everywhere and gradually but surely the enterprise showed signs of returning vitality.

This same picture fits many telegraph offices. It is simply a question of a difference in frame. Nature has endowed many of our managers with business qualifications that make them shine, while others have had to fight hard for the knowledge they possess.

Success is a result of brain work. Some brains work easier than do others, but all have to be exercised in the gain of knowledge, which is the foundation stone upon which are reared reputations. What is your reputation? Have you any weaknesses? If you have, are you strong enough to overcome them? Try it and see. Some people imagine that it is necessary to resort to alcoholic stimulants when they are fatigued. Are you one of them? If you are, do you think it not possible that the habit will grow and that as time wears on the amount of stimulant will have to be increased to keep up the human electromotive force? Perhaps your weakness is a disposition to find fault with everyone in the service. When some employes accomplish difficult tasks, instead of receiving praise, ice water is dashed in their faces. This no doubt has a cooling effect, but does it pay? Is the manager the gainer by conducting his business along lines of this description? Why not praise where praise is due?

It is the nature of all of us to do the best we can under the circumstances and conditions under which we labor, and it is a great mistake to suppose that the interests we have in charge will be safeguarded and promoted by any other than decent treatment meted out to all. Let us resolve, no matter how irritable we find our surroundings, to improve our business conduct from day to day. If we think that our labors of today will pass the closest scrutiny of the efficiency engineer, let us endeavor to improve the high standard tomorrow and go on improving from day to day until each twenty-four hours has been resolved into a day of recreation and pleasure, no matter how difficult our labors may be.

(To be continued)

The Metric System in England.

The Decimal Association of England is endeavoring to "decimalize" the English coinage and weights and measures. Resolutions in favor of the movement have been passed by numerous important public bodies. One of the recommendations submitted by the president of the Institution of Electrical Engineers to the Board of Trade Committee on the Electrical Trades, was "that the use of the metric system be made compulsory after a reasonable period, and during this period all trade catalogues make use of both the British and the metric systems."

TELEGRAPHY AND TELEPHONY IN NEW YORK CITY COLLEGE.—The division of engineering of the physics department of the College of the City of New York will offer a vocational course in telegraphy and telephony next term, open to interested outsiders as well as regular students. The pupils are to be taught methods of construction, installation, testing and maintenance of telegraph and telephone apparatus.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions following each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Radio Telegraphy.

ALTERNATORS.

The transformer receives its power from an alternating current generator, or alternator, as it is often called, which is either belt or chain driven from an engine or electric motor, or directly driven by electric motor, in which case the two machines are mounted on the same bedplate and the shafts connected by a flexible coupling, the set being called a motor-generator set. The two essential parts of an alternator from an electrical point of view are the fields and the armature. A direct current is supplied to the former and an alternating current is delivered by the latter. Alternators are built in three general types, with revolving field, revolving armature, and of the inductor type, of which the last two are generally used in radio work. In the revolving armature type the fields are stationary and the armature rotates, its wires thus cutting the magnetic lines from the field windings and generating the alternating current which is brought out by brushes bearing on two collector rings, or slip rings, as they are called. In the inductor type both the field and the armature are stationary, the rotating part being simply an iron form with projecting pole pieces, the rotation of which carries the magnetic lines from the fields in and out of the fixed armature, the wires of which thus cut the magnetic lines and generate the alternating current. In this type of machine there are no revolving wires or moving contacts of any kind. The moving part, as armature, field, or inductor, as the case may be, is called the rotor. The stationary part is called the stator.

The alternator fields require a direct current for their energizing which may be furnished either by an outside direct-current source, such as the direct-current mains that supply the power to run the direct-current motor of a motor-generator set, or by an exciter, which is a small direct-current machine that may be mounted on the alternator shaft or may be a separate machine independently driven by any convenient means.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

From what does a transformer receive its power?

What are the two essential electrical parts of an alternator?

What kind of a current is supplied to field magnets of an alternator, and what kind of a current is delivered by the armature?

How many general types of alternators are there?

What are the principal features of the inductor type of alternator?

If, as in the inductor-type alternator, both the armature and field are stationary, how is the electric current generated?

What is the rotor and the stator of an alternating-current machine?

Telephony.

THE INDUCTION COIL *(Continued)*

Comparing this figure with Fig. 1 (June 1), it will be seen that at each station the secondary winding of the induction coil has been substituted for the transmitter, which has been placed in a small local circuit with a battery and the primary winding.

This local circuit isolates the battery and transmitter from the rest of the circuit, so that the length of the line no longer affects the strength of the current in the transmitter.

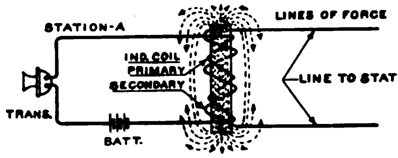


FIG. 4.

In order more clearly to illustrate the action of the induction coil, station A in Fig. 3 has been redrawn in Fig. 4 to show the windings on the spool.

If no one is talking into the transmitter, the pressure between the carbon granules in the transmitter button remains constant and a current of constant strength flows through the transmitter and the primary winding of the induction coil. As this current passes through the primary winding, it magnetizes the core and causes the coil to be surrounded by a field of magnetic influence which is represented by the "lines of force" shown in the sketch. Now as long as the strength of the current remains constant, the number of "lines of force" surrounding the core remains unchanged, and no effect whatever is produced on the secondary winding. But if the strength of the current in the primary winding changes in any degree whatever, a corresponding change occurs in the number of "lines of force" surrounding the coil. Whenever such a change occurs a very wonderful and mysterious action results, for an electrical pressure is created in the turns of the secondary winding which causes current to flow from the winding through any circuit to which it is connected.

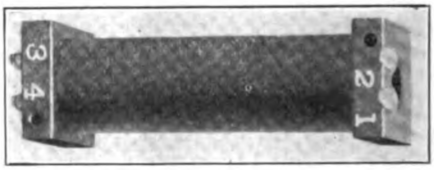


FIG. 5.

Referring again to Fig. 3, suppose that some one is speaking into the transmitter at station A. Then the vibration of the transmitter diaphragm, continually changing the resistance of the transmitter button, causes a continual change in the current from the battery which flows through the primary winding. As the strength of this current continues to vary, corresponding changes occur in the number of the "lines of force" surrounding the coil, and these changes in turn create electrical pressure in the secondary winding. This causes waves of current to go out over the line to station B, where they pass through both the secondary winding of the coil and the receiver. As they pass through the receiver they cause its diaphragm to vibrate in tune with them and thus to reproduce the vibrations of the distant transmitter diaphragm.

The induction coil made the establishment of long distance telephone lines possible by providing a means for supplying the telephone transmitter with a suitable amount of current under all circuit conditions.

The No. 13 coil shown in Fig. 5 is used with the so-called "local battery" telephones—that is, where a battery is supplied at each subscriber's station. The No. 20 coil is used with central battery telephones, and though it operates on the same principle as the No. 13, it is put into the circuit in a slightly different manner.

(To be continued)

Telegraphy.

ARRANGEMENT OF CELLS IN BATTERIES.

Assuming, as before (see Fig. 1, May 16 issue, and Fig. 1, June 1 issue), that each cell has an e. m. f. of one volt, and an internal resistance of two ohms; the internal resistance being, as already said, the resistance of the plates, the connecting wires in the cell and the liquid of the cell; which internal resistance varies inversely with the size of the plates, their nearness to each other, and with the nature and condition of the solution of the cell. The external resistance, as previously stated, is the resistance of the circuit outside of the cell.

With six cells in series, therefore, we have six volts e. m. f. and twelve ohms internal resistance, which, according to Ohm's law, gives $\frac{6 \text{ volts}}{12 \text{ ohms}} =$ ½ ampere. In the case of Fig. 1 (June 1 issue), on the other hand, we have, by placing the cells in multiple, practically doubled the size of the cells, and consequently have halved the resistance, so that while the electromotive force is the same as before, the total internal resistance, that is, the joint resistance of the two rows of cells, is six ohms and the strength of current in wire *W* will be $\frac{6 \text{ volts}}{6 \text{ ohms}} = 1$ ampere. In other words, if instead of using two rows of cells we should reduce the internal resistance of the first row by increasing the size of the copper and zinc plates, and by bringing the plates in the cell nearer to each other, so that the internal resistance of each cell should be one ohm instead of two ohms, we would have, in the external circuit, virtually, the same result as with the two rows; that is, $\frac{6 \text{ volts}}{6 \text{ ohms}} = 1$ ampere.

If the twelve cells (see Fig. 1, June 1 issue) were placed in one series instead of in multiple, the resulting electromotive force would be twelve volts and the strength of current would be $\frac{12 \text{ volts}}{24 \text{ ohms}} = \frac{1}{2}$ ampere. And, further, it will be found that as long as each cell has an e. m. f. of one volt, and an internal resistance of two ohms and the external resistance of the circuit continues low, the current will be the same in the external circuit whether we have one cell or 1,000 cells in series, since, in that case, it will be evident that for every volt electromotive force added to the circuit there are added to the same circuit two ohms resistance. For example, with one cell, $\frac{1 \text{ volt}}{2 \text{ ohms}} =$ ½ ampere, or with 1,000 cells, $\frac{1{,}000 \text{ volts}}{2{,}000 \text{ ohms}} = \frac{1}{2}$ ampere.

QUESTIONS IN TELEGRAPHY.

What parts of a cell cause the internal resistance?

A battery of six cells in series has an electromotive force of six volts, and an internal resistance of twelve ohms, how much current will it deliver to an outside circuit?

If a battery has 1,000 cells and an e. m. f. of 1,000 volts, and the internal resistance is 2,000 ohms, what will be the value of the current delivered to an external circuit?

Shop Talk.

BY THE OBSERVER.

All will admit that there is truth in the old saying: "The Lord loveth a cheerful giver," therefore we might assume that the world loves a cheerful person, and we would not be far wrong. Now, such being the case, it behooves us to try and keep down all outbursts of temper, and even if you have to take it out in thinking, well—you cannot hang a man for thinking, but do not think about anything that you would not care to have known, somewhere at least. I usually feel the best when I lose the grouch and all of its progeny.

We are told that pride was the cause of the fall of the archangel Lucifer, and there is an old saying that "pride goeth before a fall." All of us should have a certain amount of pride, because without some pride we are likely to become listless and careless, but beware that you do not let your pride carry you into the zone of the "swelled heads."

No person has any right to unduly feel his importance, for did you notice that during your two weeks' vacation last year the office kept right on going, and don't you realize it would have continued if you had never returned? Of course, there may have been a few things that did not go to suit you, but that does not alter the fact that they suited the man higher up, or he would have called attention to the short-comings and then the missing items would have been found at once and for all time. I have delved into the subject of pride to try and show that there are many of us who belittle "the other fellow," and we occasionally hear the remark, "I'll bet I could fix that in five minutes," or words to that effect, directed to the man at the other end of the wire. Such a remark is uncalled for, unfriendly and illogical, because you do not know whether you could, or could not, do as you claim, without first seeing the particular thing involved. A better way is to say, "how does it act, perhaps I can assist you." I do not think we should offer to assist until we are asked, but it is indeed a mark of disrespect for anyone who is approached to retort, "I do not need any of your help." A better reply would be, "Thanks, will let you know in a minute," if you did not care for the proferred help, or accept it by narrating how the thing acted. In any event promote, but do not disrupt, friendly relations.

If any one feels that he is so intelligent as to permit him to enter the zone of the "swelled heads," I would like to lay before him the Encyclopedia Brittanica and say "tell me how much of this do you know?" It is indeed a pity that, although we plod along our whole lives, being studious, we find the more we learn, the less we know, because the more we learn the more we find out exists that we have only a slight knowledge of. In many cases there are some "ologies" we never heard of until we chanced to see mention of them in the dictionary. Therefore by reading a trade journal and purchasing books devoted to a particular trade, we derive the greatest benefit, for as Edmund Burke said, "to read without reflecting, is to eat without digesting." Now the moral is no one man can know everything and I believe I am safe in stating that no one man knows everything about the telegraph business. Remember there are many departments and each has its own specialist. There may be some subordinate in a department that is as well qualified as the so-called specialist, or expert, but another man may not rank with either who excels on some particular points. It would seem then by a little thinking we will arrive at the fact that by co-operating, or combining our knowledge at certain times great results will be produced and the annihilation of the zone of the "swelled heads" will follow. *(To be continued)*

ORDER OF RAILWAY TELEGRAPHERS.—The biennial convention of the Order of Railway Telegraphers which was held in Seattle, Wash., recently, closed its sessions May 28. Mr. H. B. Perham of St. Louis was reelected president and Mr. C. B. Rawlins of Moores Hill, Ind., was elected secretary and treasurer in place of Mr. L. W. Quick, who has occupied that office sixteen years. The next meeting will be held in St. Louis, Mo., in 1919.

Two things every operator should do: Buy a Liberty Bond and subscribe for TELEGRAPH AND TELEPHONE AGE.

Progress in the Telegraph, Telephone and Wireless.

Developments in telegraphy, telephony and radio telegraphy in 1916-1917 is the subject of a review by Mr. John L. Hogan, Jr., chief research engineer of the National Electric Signaling Company, published in a recent number of the *Electrical World.*

Line wire telegraphy and telephony in the United States, says Mr. Hogan, have been so completely standardized and give such excellent service under normal conditions that there is little indication of any radical change to be expected to the practice of either. Vacuum tube amplifiers of the "audion" type are finding greater and greater use in the electrical transmission of speech, and it is presumed that they will be further extended.

In wire telegraphy, the extension of printing systems is to be noted. Keyboard transmitters connected in synchronous multiplex relation to page-printing receivers, obviously increase line capacity and decrease message transmission costs where the volume of traffic is large. In addition to the synchronous multiplex printers, one or two forms of non-synchronized printing telegraphs have demonstrated their practicability and will in all probability find further commercial applications.

In cable telegraphy various proposals of interlinking wire telegraph and cable systems by direct relays, to avoid manual repetition of messages, as well as plans for distortionless alternating-current working, were brought out during the year. The use of magnifiers, usually of the galvanometer-controlled heated-wire type, is said to be proving important in increasing cable speed and signalling reliability.

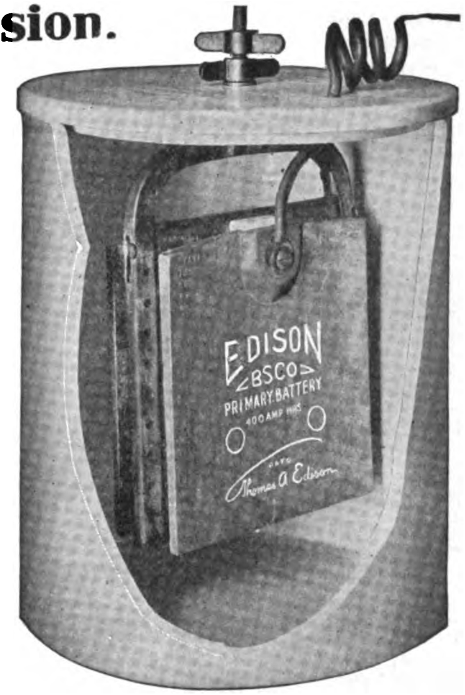
Both in radio telephony and radio telegraphy new devices and modes of operation are constantly appearing. The commercial practice is fairly well defined, and entirely satisfactory within proper limits, but new inventions (or new applications of old ideas) continually tend to extend the limits and to make radio available for new uses.

In radio telephony, nothing fundamentally new has appeared since the earliest work involving vocal modulation of a continuously radiated stream of sustained electromagnetic waves. Yet the practical work of the first experimenters has been completely eclipsed, in so far as magnitude is concerned, within the past year or so.

An important difficulty which confined radio telephony to short-distance working was that of modulating the high frequency power in accordance with voice waves. This problem seems to have been solved in a large measure by the development of magnetic and vacuum amplifiers. The generation of powerful streams of sustained waves, for either telegraphy or telephony by radio, has been practicable for many years. There remains in both branches of the wireless art, however, what is perhaps the most difficult problem of all. This is the elimination, or reduction, of the harmful effects of atmospheric interference. Until the "stray" or atmospheric problem is solved, wastefully large power is essential at the transmitting station, for the signal at the receiver must be so strong as to dominate the sounds of "static."

Clear Transmission. Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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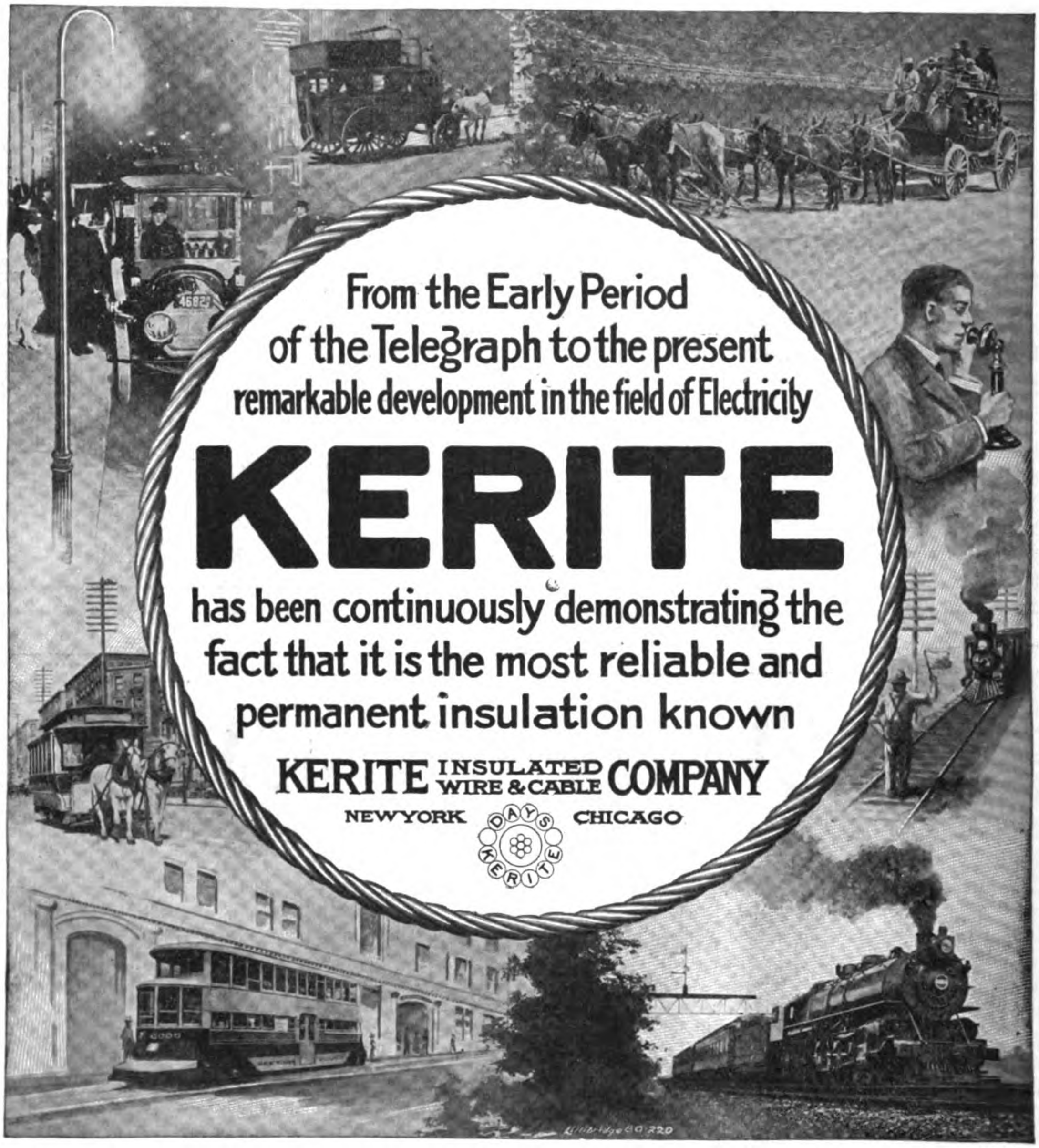

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of the Telegraph to the present
remarkable development in the field of Electricity

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KERITE INSULATED WIRE & CABLE **COMPANY**

NEW YORK DAYS KERITE CHICAGO

THE RAILROAD.

Mr. M. H. Clapp, president of the Association of Railway Telegraph Superintendents, announces that a meeting of Special Committee No. 1, construction and maintenance—outside plant, will be held in Chicago some time during the latter part of this month.

Mr. E. P. Griffith, superintendent of telegraph, Erie Railroad, New York, has returned from Mt. Clemens, Mich., much improved in health. Mr. Griffith was confined to his home suffering from rheumatism for many weeks.

Mr. L. F. Saylor has been appointed supervisor of commercial telegraph service, Rock Island Lines, Chicago, Ill. Mr. Saylor's duties cover the entire system.

Women on Railroads.—Railroads will employ women in numerous clerical positions to release a large number of men for railroad work not suitable for women. Women also will be employed in light work about the shops as telegraphers, in signaling, train dispatching, ticket selling and car cleaning.

New Southern Pacific Office.—The new Portland, Ore., railroad telegraph office of the Southern Pacific Company is one of the finest and most complete on the Pacific Coast. The operating department is located on the seventh floor, and light is admitted through windows on three sides. All of the furniture is new, and the operating equipment is up to date. Mr. Chas. T. Day, a well-known telegraph expert is manager of the office.

Mr. P. W. Drew, superintendent telegraph, Minneapolis, St. Paul and Sault Sainte Marie Railway Company, Chicago, Ill., writes: "Enclosed find check for $2.00 to renew my subscription to your excellent Telegraph and Telephone Age. It grows better and better as the years roll around."

Opportunity.

Mr. James J. Wood, the inventor of the "Wood" system of electric lighting and one of the best known men in the electrical field a few years ago, gave a short address recently before the Electrotechnical Club, Fort Wayne, Ind., on the subject "The Opportunity." Mr. Wood, it is needless to say, is a man of energy and is progressive or he never would have attained the position he finally reached in the electrical field, and what he has to say on "Opportunity" will fit in in any line of work.

Opportunity, he says, consists of being prepared to a point, or degree, where you are able to take advantage of the improved conditions or environments by which you are surrounded, and can better your own condition thereby. This definition removes the element of chance or uncertainty and assumes that you are prepared to act with vigilance, tact and aggressiveness, which will carry your project to a successful issue. Therefore, other things being equal, they have the most opportunities who possess the most practical and useful knowledge.

The man who is really ambitious is the man who is never satisfied. The truly ambitious man says "No matter what I do I shall simply try to do better. No matter how hard it may be, I will improve." To do this you must keep at it—work your very best just where you are. Don't waste time dreaming of what you might do if things were different. The only thing you can do is to develop yourself and you can do that right where you are. Keep at your work. Don't shirk whatever you have undertaken. Don't think that idleness or shirking cheats an employer. It cheats the man who shirks. The man who is always watching the clock or listening for the whistle, and thinks he is doing all he is being paid for, is not earning his pay, and he never advances very far.

To make a real success you must have, first of all, industry, stick-to-itiveness and the faculty for hard work. This latter quality is greater than all others put together, and you can cultivate it in yourself. Map out what you are going to do each day, and do it. Never let yourself get into the habit of leaving a thing unfinished. It is hard—for some it is almost impossible—but if you will do this, you can make yourself a hard worker eventually. That is the first step to real success.

What I would most earnestly impress upon the young man of today is this: You must study your own character and find out your own weakness; you must make up your own mind what qualities are necessary to push you ahead, and cultivate them, remembering that whatever you do has got to be done absolutely by the exercise of your own will power. If you deceive yourself, blaming others for your failure, you will never get ahead. You must be your own most severe judge, and remember that it is not sufficient to wish for success, or to admire the qualities that make success. You must develop those qualities and use them, bearing in mind that the favorable opportunities for the young man of today are greater than ever before in the history of the world, on account of the wonderful advance in the sciences, arts and application of electricity to the use of mankind, opening up vast possibilities and untried field for research and improvement, thereby giving the young man of this twentieth century such opportunities for advancement as were never dreamed of before.

INDUSTRIAL.

A Solution of the Local Battery Problem.—The United States Government is using the diaphragm telegraph sounder on the Alaska lines and more than 100 railroads have them in operation on their service lines. These facts are noteworthy recommendations for this unique instrument, which solves the local battery problems in railroad offices and telegraph offices in general. These instruments are giving satisfactory results; they are trouble-proof and economical, and cost nothing to maintain. The device is attachable to the relay points, and magnifies the sound of the lever to such an extent as to produce the noise of a sounder. Once it is installed no further attention is needed, and the worry over the uncertainties of the local battery may be dismissed from the mind. The diaphragm sounder is made by the Railways-Labor Saving Device Company, Davenport, Iowa.

The Progress of the Telegraph.*

BY F. W. LIENAU, SUPERINTENDENT TARIFF BUREAU, WESTERN UNION TELEGRAPH COMPANY, NEW YORK.

A considerable portion of the increased load which the telegraph has recently been called on to carry is no doubt the reflex of the general extraordinary stimulation of business during the last two years or so. But paralleling this abnormal increment attributable to the special conditions of the day, there has been proceeding at a constant ratio of increase a growth of traffic of a more permanent and substantial character. To this a number of causes have contributed. The introduction of the night letter and the day letter services some years ago marked a notable step forward in the extension of the utility of the telegraph to the public. The American people are quick assimilators. They cannot afford to waste the proverbial nine days in wondering at any innovation. It is stripped of its newness with very much the same dispatch with which young America removes the nice, shiny paint from a new red wagon, and the novelty of yesterday becomes the commonplace of today. So the new overnight and deferred day services, affording the facility of sending (as their names imply) communications of letter length by wire, at low cost, promptly made a permanent place for themselves in our scheme of business and social correspondence. They have had much to do with opening the way to a better understanding of the adaptability of the telegraph to an infinite variety of purposes, for which it had in former years not been recognized as available, and have thus, in conjunction with other elements, to which further reference will be made, played an important part in bringing about a change in the public mind.

We do not have to go so very far back to recall the day when a telegram was commonly associated with the idea of calamity and distress. Though this extremely old-fashioned superstition may now safely be said to belong to a past epoch, there still persisted the conception of the telegraph as an instrumentality to be used only in cases of extraordinary emergency, its employment even for business purposes, though in the aggregate of respectable proportions, being restricted by the limitations of this narrow aspect. This point of view, as has been said, has been undergoing an important modification. The speeding up of modern business processes calls for the quicker handling of transactions. Constantly sharpening competition has brought home to the business man the necessity of keeping in the closest touch with the trade to which he sells, as well as with the market from which he buys, and with the units of his own organization. Men of constructive imagination have been quick to discern the value of the attention-compelling power peculiar to the telegram. They have reasoned that a telegram always commands preferred consideration; that it always reaches the man who decides and is not sidetracked by some routine, mail-handling clerk; that its appeal is powerful and its demand for prompt action insistent, and that for these reasons it offers the most effective way of presenting any proposal—and this, whether it be to a single individual or to a number of people. As a result of the experiments in this direction the telegram has demonstrated a quite remarkable efficiency as a sales medium and business builder, and with experience its employment in this capacity has grown. Many concerns throughout the country, whenever they have some special offer to present to their customers, now do so by wire. This may involve only a dozen or so messages simultaneously sent, or it may involve anywhere from one or two hundred to many thousands. Files of five hundred or a thousand telegrams at a time are no longer uncommon. A department store found it a profitable enterprise to announce a special sale by sending 33,000 night letters to residents of the city and the surrounding territory. There have been other occasions when more than 100,000 telegrams were sent simultaneously.

The telegram is being used for buying as extensively as it is for selling. Dealers, large and small, are utilizing it most freely to keep their stocks frequently and newly replenished, with a consequent saving of capital tied up and of wastage in dead stock. Again, it has been found to be a most effective agency for bringing in delinquent accounts. Wholesalers and jobbers employ it as a constant encourager of their sales forces. In soliciting orders, it has become a frequent custom to request that they be sent by telegraph at the sellers' expense, a self-addressed telegraph blank being enclosed for the purpose.

The social use of the telegraph has likewise become more general. Travellers have developed the habit of keeping in touch with their families by night letter, probably because a night letter received at the breakfast table on the morning after it was sent has a freshness lacking in a letter from one to five days old. The convenience of telephoning a telegram to the telegraph office from the home has had much to do with the enlarged employment of the telegram for social and family messages.

The development of facilities for handling the traffic has kept pace with the increased use of the service. The telegraph of today is a very different affair from the telegraph of a generation ago. Once upon a time a certain Congressman spread upon the *Congressional Record* a speech in which he made the statement that telegraph companies were not progressive and consistently refused to encourage inventors of new methods. It would be interesting to lead the distinguished gentleman (now long since retired) through a modern telegraph office and to exhibit to him what has been accomplished in the perfection of automatic telegraph transmission. The Morse operator still holds his place, and probably will indefinitely, as for certain purposes manual operation by means of the Morse key and sounder is most efficient. But the conditions of today demand in addition newer methods for handling the vast volume of traffic. The development of automatic telegraph apparatus has occupied the attention of scientists for many years. Many contrivances have from time to time been perfected and have had their day, to give place to improved and more effective mechanism. There are now in successful operation a number of devices by which messages, written on a typewriter keyboard by the sending operator, are reproduced directly and automatically by a typewriting machine upon the proper telegraph blank at their destination, ready for delivery to the addressee. And invention has not stopped there. The Western Union Telegraph Company has in daily use, over many circuits, with more to be added as conditions require, apparatus by means of which eight messages—four in each direction—are simultaneously transmitted over a single wire, the entire process being automatic. This is an accomplishment which speaks for itself.

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*The Nation, New York.

In handling telegrams seconds count, and the great object to be achieved is the elimination of every moment's loss of time. Moving belts and pneumatic tubes have been installed in the operating rooms to carry the messages from one operator's station to another. Where boys and girls are employed to carry messages from one part of the room to another they are equipped with roller skates. Numerous other time-saving devices have been provided, and new ones are added as fast as they can be devised. There has been constant improvement in the methods of keeping a check on the movement of the traffic—within the offices by a highly developed supervisory organization, and between offices by a system of traffic dispatching by means of which dispatchers stationed at certain centres are constantly advised of the traffic condition of every wire in the country and may direct the movement of the business accordingly.

Whether more exacting demands beget improved facilities or whether improved facilities breed more exacting demands is a question as difficult to answer as that concerning the precedence of the hen and the egg. In any event, there is no doubt a reciprocal influence, and it is the telegraph company's task to keep the facilities always a step in advance of the demand.

New Method for Testing Insulation.

Mr. Sidney Evershed, of London, England, has made some insulation testing investigations, the results of which are the subject of a patent recently issued to that gentleman. In making the test no new type of instrument is involved. One of the claims states that one of the causes of the relatively low resistance of insulation when tested at high voltages, is the presence of moisture in absorbent insulating materials in the form of drops and thin films which form leakage paths for electric current.

When an insulator in that condition is subjected to electric pressure the propelling force known as electric endosmose drives water out of the drops in the films, thereby increasing their thickness and decreasing the resistance of the leakage paths.

If the electric pressure is gradually increased the insulation resistance of absorbent materials falls, rapidly at first, but more and more slowly as higher pressures are attained. The relation of voltage to insulation resistance may be expressed by a smooth curve which is convex to the base line from which resistance ordinates are measured, so long as the endosmose or film effect is the principal factor in determining its shape or law of curvature. Ultimately, if the increase in voltage is continued, the curve passes through a somewhat undefined point, or region, of inflection, and then begins to bend downward toward zero resistance, the curvature rapidly increasing until actual breakdown occurs. The complete characteristic curve, as it may be called, therefore consists of two parts of opposite curvature joined at a point or region of inflection, indicating the growth of a dangerous mode of leakage which ultimately ends in a breakdown of the insulation. These two significant parts of the curve may be referred to as the "film curve" and the "breakdown curve."

The law expressing the shape of the film curve is much the same for all absorbent materials, provided they do not contain more moisture than they can harbor in the form of drops and of thin films.

The Modern Messenger.

"The day of the $6 a week messenger is gone," said a forty-year old telegraph messenger, recently. He was delivering a cablegram early one morning, when he was encouraged to talk a little on his work. "It's the early bird that catches the worm," he said, "and I'm the early bird these days. There are many cable messages to deliver in the early morning, accumulation of over night, and we get four cents each for delivering them. That's the business I'm after and I am at the office as early as they will let me get busy. I take out at least sixty cables every morning by about 10 o'clock, and that makes $2.40 for me anyway. Then there's the rest of the day for what other cables I can catch and a big lot of telegrams, for telegrams are plentiful in this district now. They mean two and a half cents each to deliver. It's a poor week that I don't turn $30, and there's a lot more that do equally as well or better.

"Why," he continued without even a slight note of envy in his voice, "some of our 'boys' have as much as $20,000 to their bank account. They are the ones who save their money, and when they get a tip from a broker's office, either overheard or given to them directly, they can take advantage of it—and there are quite a few tips on the market that are got both ways, for that's the kind of tip I mean and not a dime, a quarter or even a dollar for delivering some good and joyous message."

Those who are quite satisfied sit still and do nothing; those who are not quite satisfied are the sole benefactors of the world.

Telephone Transmission.

In a long telephone toll line there are many sources of electrical disturbances which affect the transmission and so distort the character of the waves that the development of means to neutralize these effects is perhaps the most important advance in telephony outside of the invention of the telephone itself.

The Sibley Journal of Engineering, Cornell University, Ithaca, N. Y., recently published an article on this subject by Mr. Bancroft Gherardi, engineer of plant, American Telephone and Telegraph Company, in which he gives many interesting engineering facts regarding the New York-San Francisco line.

A New York-San Francisco circuit, he says, or rather the circuits which combined together constitute a New York-San Francisco circuit are representative of many telephone circuits which together form a network connecting the principal centers in the United States. The distance from New York to San Francisco is 3,400 miles. The circuit in question consists of two wires each weighing 435 pounds to the mile or a total of about 3,000,000 pounds of copper. A circuit such as this for the telephone current having an average frequency of 800 periods per second would deliver at the receiving end one fifty billionth of the energy put in it at the transmitting end. Certain limitations on the power of telephone transmitters and the sensitiveness of telephone receivers establish the fact that it is not reasonable to expect good transmission on a line which does not deliver to the telephone receiver at least one thousandth of the energy sent out by the transmitter and in many cases one one-hundredth or more is desirable.

One step in improving the efficiency of a long line is to add to it at suitably determined intervals specially designed inductance coils known as loading coils. On the New York-San Francisco line there are about 400 such coils spaced at intervals of about eight miles. These coils diminish the losses in the circuit to such an extent that it will deliver at the receiving end about one millionth of the energy put in the circuit at the transmitting end. This proportion of received energy is still far below that needed for commercial service.

Because these loading coils occur successively in the line any losses in them are cumulative and as every inductance coil must have losses both in its conductor and in its core these must be carefully studied. An apparently insignificant loss of only one per cent. of the energy in each loading coil would mean that the received energy would be less than two per cent. of what it would have been had there been no losses in the coils. Actually on this circuit, the loss in the coils reduces the received energy to about one-quarter of what it would have been had the coils been without energy losses.

Further improvements have been made by associating with this line intermediate apparatus known as telephone repeaters and capable of receiving an enfeebled electric current and putting into the line a new electric current derived from a separate source of energy and controlled by the enfeebled received electric current, so that the new current possesses the same characteristics in regard to shape but is greatly magnified. The use of such apparatus required a comprehensive study of amplifiers, methods of connecting them into the circuit and of line characteristics, and many rearrangements in the existing lines so as to adapt them to the new methods of working. Thus it is possible to receive at the distant end of the circuit energy equal to one-eightieth of that placed upon the circuit at the transmitting end and thereby give good commercial service.

The Simplification of Line Testing.

BY GEO. F. TANNER.

In every case where a Varley loop test is made, the question which at once arises to the orthodox is, "what is the weight per mile of the conductor under test?" In the generality of cases, as, for instance, in testing over a paper cable where the conductors are of the same gauge, or where it is possible to obtain similar conductors, this knowledge is not only unnecessary, but frequently contributes to a less accurate result.

There is no originality about the following method, yet, as it appears to be seldom used, it is perhaps excusable to bring it under notice.

Provided the conductors comprising the loop under test are of the same gauge, the only known factor required is the distance between the two testing points.

Assuming the conditions of the ordinary Wheatstone bridge test for an earth fault, then calling the result of the resistance of loop test, London to Birmingham, L, and result of distance test *l*, and distance to Birmingham D miles, the distance of fault in miles

$$= \text{D} \times l/\tfrac{1}{2}\,\text{L} \text{ or } 2\,\text{D} \times l/\text{L}.$$

That is, the result of the first test divided by the result of the second test, multiplied by twice the distance over which the test is made, gives the distance of the fault in miles.

It will be seen that the result of expressing the distance of the fault as a fraction of the loop itself is to fractionize all inaccuracies due to slight variations in weight per individual mile. It is independent of temperature correction also. The method produces a truer result than by slavishly working out the problem on a resistance-per-mile basis.

I may add that the application of this method has yielded more successful results in practice than the older and more general method; it also has the advantage of being much simpler.—London *Electrical Review.*

A MODEST TELEGRAPH COMPANY.—The Chinese-Jamestown and Sonora Telegraph Company, operating in Sonora-Chinese Camp, Cal., reports for the year ending December 31, 1916: Total fixed capital, $1,200; total assets, $1,209.89; operating revenue, $276.59; operating expenses, $214.56; net operating revenue, $62.03; surplus, $9.89.

HIS PREFERENCE.—A tramp, looking for work, showed a preference for a position as lineman for a wireless telegraph company.

MR. JEFF W. HAYES' DEPARTMENT.

The Pleiades Club.

CHAPTER XV.

It was a bright, intelligent lot of men and women who called upon Secretary Fred B. Moxon, on the planet Mars, quite recently.

The spokesman, Ernest W. Emery, who had in his possession half a year's files of TELEGRAPH AND TELEPHONE AGE, addressed Mr. Moxon.

"We are no kickers," he began, but Charles A. Tinker just gave us all these late copies of the AGE, and we notice that among the records of the club, of which you are secretary, you never vouchsafe a kind word for any of the eastern boys or girls. There is nothing right about this, and you must admit it. Our friends down there on the earth are as interested to hear from us, as are the survivors in the Windy City or the dwellers on the Nebraska prairies."

"Right you are," replied Mr. Moxon, "and I do not think anyone is to be blamed for it. Washington is the city where I was born and bred and it fills a deep place in my heart, but the club is still young and my correspondent is covering the ground systematically, and you will all be heard from. Indeed, you will all have a chapter in the very near future, and if you will give me a little 'dope' on some of our present members who are bashful, I will get you all in excepting your photographs, very soon."

Peter DeGraw, Ham. Young and Ernest Emery then locked arms for a walk down the Rue for the purpose of interviewing other old members of the guard from Washington and procuring additional data.

"Hello, there's Bob Bender, newly arrived and looking as fresh as a clam. He was an attendant at the recent reunion of the Old Timers Association in New York and ought to be full of good information. Let's stop him and get the news."

Bob Bender was delighted to greet his old friends again and listened with much interest to the experiences of his companions and, in turn, gave them the latest news from Washington.

"Yes, George C. Maynard is there, looking as noble as ever, and Judd Thompson, C. F. Thompson, H. McKeldin, John H. Miller and Dennis Brown are still in the harness. Washington has gone dry."

Mr. Bender went on to say that he had been over to New York recently, but as there was going to be a New York Chapter in the Pleiades Club very soon, and also a Boston, Philadelphia and Baltimore number, he did not care to spoil a good story by anticipating the future.

Mr. Bender locked arms with his comrades in their interesting walk, and as they passed Aeolianville they stopped to shake hands with William T. Loper, who was being entertained by that most wonderful orator, Henry Ward Beecher.

The quartette, composed of Messrs. Emery, DeGraw, Bender and Young, stopped for a minute. They had overheard some "shop talk."

"Yes," Loper was saying, "you are the only fellow who ever rushed me. Don't you remember your sermon on 'Agreeing with your enemy,' and none of us could keep up with you? I came nearly throwing up my job on that very occasion." It was stated for the benefit of those who were not acquainted with the facts that each Sunday Mr. Loper went from Washington to New York to copy Henry Ward Beecher's sermon. He then went to the telegraph office at 195 Broadway, New York, and the sermons were telegraphed from his note book to the principal papers in the United States by Mr. Loper himself, who was one of the finest operators as well as stenographers of his day, and one of the few shorthand men who could copy Henry Ward Beecher.

"Hi, hi, 73," came from the merry four and Loper smiled all over, while Beecher asked what was meant by "73."

Later in the day Fred Moxon interviewed his morning visitor and made inquiries about the Cassidy boys, James P. and John S., and many other of his boyhood friends still on earth.

"We will have a Washington day very soon and we will invite all of our old friends from near-by and I hope that each city will get up a similar demonstration, as these meetings are all for the good, and as the records of the same will be printed in TELEGRAPH AND TELEPHONE AGE, it will be a great comfort for our surviving friends to read of the good times we are having up here."

"When I was in the Washington office," said Ham. Young, "it gave me great pleasure to assist our boys through their difficulties, and make their lives less burdensome, and it now makes my heart feel good to see those who have passed from earth to Mars enjoying their well-earned rest. The Washington boys all partake of the nature of the 'Father of his Country,' whom we have all met in this ethereal mansion on various occasions, and are proud to be identified with so distinguished a gentleman, though we are all on a level here."

"Washington is very different now to what it was years ago when I used to rattle off the Associated Press news," chimed in Vory DeGraw. "We had no multiplexes and page printers those days and each man was an artist at the key. I have nothing but the happiest recollections of my old telegraph friends in Washington, several of whom have recently joined the throng in this abode of rest and happiness."

Ernest Emery's eyes sparkled with greater brilliancy than ever as he heard the names of his old-time Washington friends mentioned. "I hope that 'Washington day' will be an event worthy of the great city and its associations" he said. "Being the capital of the nation the best men in the telegraph profession exist there, and those now here will enter into the festivities of the occasion with the greatest of pleasure, when their lives in that city are recalled and rehearsed. All will have something pleasant to relate."

Bears.

The story related by Pete Lovell, once superintendent for the Western Union, and located in the White Pine district of Nevada, which he was wont to tell with much unction, of the bear which treed him in a lofty telegraph pole, has been told and re-told around the camp fires of the overland line repairers and construction men and should be told in print.

With a fusilade of chewing tobacco, Lovell repelled the attacks of Sir Bruin, the strong and unsavory juice being squirted into the bear's eyes by the doughty Peter who was an ardent chewer of the weed. After an hour or more of attack and retreat, the bear retired, covered with defeat and tobacco juice, leaving Peter Lovell to exploit his story to his co-workers.

In the northwest portion of our continent is situated the beautiful city of Vancouver, B. C. Mr. John Fletcher now superintendent of traffic was chief operator for the Canadian Pacific Railway at this point in 1899 and a bear story is related about him.

The telegraph lines of the Canadian Pacific telegraph are modern and first class and "Durability first" is evidently the watchword with that company.

The weather during the winter time in this far away country is very cold and the frost keeps the wires tuned up to such a tension that music like unto an aeolian harp may be heard quite frequently.

It seems that this music mystifies Bruin who, mistaking it for the humming of bees, proceeds to investigate, for surely bears like wild honey. He would come closer to the pole, placing his ear on it, the "humming," of course, increasing in intensity, and then he would start to climb it, quickly landing on the cross arm, when the damage would begin.

It often took the bear to three or four poles before he would be convinced of the fruitlessness of his efforts and finally, disgusted and disappointed he would return to his lair.

It took a year or more for the bears in Canada to learn that honey does not grow on humming poles, but it cost the Canadian Pacific Railway some money to make repairs after these depredations.

When John Fletcher wired his report as to the cause of trouble one day, he said, "Nos. 1 and 2 crossed near 'XN.' Cause, bears."

The general manager wired back for a more explicit cause, as "bears" was too indefinite and the explanation was given as above.

Some humorist in London got hold of the story and put it into a pictorial paper, thus immortalizing Bruin in his mad search for wild honey.

Chicago Western Union.

The offices of J. C. Nelson and A. R. McGrath, district commercial superintendents of the Western Division, which were located on the fourth and third floors, respectively, of the Western Union Building, have been moved to more pleasant and commodious quarters in the Webster Building, the old quarters being utilized by the traffic department to spread itself, which was much needed. This change will be appreciated.

About thirty years ago there was a young operator who divided most of his time between Kansas City, St. Louis, and Chicago. This young artist was a living exponent of rapid and perfect Morse sending, and he was always warmly welcomed at each office where he was considered a valuable acquisition. The name of this gentleman is Charles Howard Shell, Sr., and he is as popular today as he was in his more palmy days of speedy telegraphy. Mr. Shell holds the record of sending 295 words of perfect Morse in five minutes, a feat unsurpassed even in this day of rapid bug sending. Later, Mr. Shell took up the study of electricity in all its branches and has qualified himself to fill any position to which he may aspire in the gift of the company. He is at present night chief. C. Howard Shell, Jr., is a chip of the old block. He possesses the large frame, kindly heart and spirit of the parent branch. Young Mr. Shell is assistant chief operator of the eighth floor.

L. W. Marsden, of "FX" office, Chicago, is taking a much-needed vacation.

H. A. Smith, recently of the multiplex force, Omaha, and who was multiplex attendant at Chicago, has been promoted to be assistant electrical engineer, in Division Traffic Superintendent J. P. Edwards' office.

A meeting of forty-one Iowa and Wisconsin managers was called to order by Mr. A. R. McGrath, district commercial superintendent, Chicago, at Hotel Sherman in that city, June 6. Mr. McGrath made an address on Liberty Loans and solicited the co-operation of the managers present for subscriptions from them as well as those of employes at offices in their charge. Everyone of the managers present signed up, the largest subscription being that of Mr. Michael Sheehan of Ottumwa, Iowa, $1,000. Mr. A. H. Allen, manager, Oshkosh, Wis., and Col. L. W. Ainsworth, manager, Des Moines, Iowa, followed with $500 each. Col. Ainsworth has also enlisted and expects to be called to the service as an army officer and to accompany the first army contingent to France. The progress in Liberty Loan subscriptions in the third district is very satisfactory. The managers were agreeably surprised by Superintendent McGrath's announcement of the bonus to be paid July 1 and January 1 next and expressed their sincere appreciation of the company's generosity and thoughtful consideration of their welfare. After luncheon the managers gave a rising vote of thanks. The following were present: Michael Sheehan, Ottumwa, Iowa; A. H. Allen, Oshkosh, Wis.; L. W. Ainsworth, Des Moines, Iowa; J. P. O'Donnell, Sioux City, Iowa; M. L. Smith, Fond du Lac, Wis.; T. H. Torrison, Manitowoc, Wis.; J. A. Kaeppler, La Crosse, Wis.; G. H. Nicoll, Council Bluffs, Iowa; E. F. Russell, Stevenspoint, Wis.; E. S. Abbott, Beloit, Wis.; J. J. Hughes, Waukesha, Wis.; H. F. White, Cedar Rapids, Iowa; E. A. Gregory, Racine, Wis.; F. B. Smith, Hartford, Wis.; A. V. Gearheart, Wausau, Wis.; J. L. Randolph, Davenport, Iowa; E. J. Rasico, Appleton, Wis.; E. F.

Walsh, Sheboygan, Wis.; F. J. Kearney, Dubuque, Iowa; A. J. Duquaine, Green Bay, Wis.; Wm. Owens, Iowa City, Iowa; C. J. Zimmerman, Ames, Iowa; G. P. Sterk, Superior, Wis.; M. A. Skelly, Chippewa Falls, Wis.; J. B. Boreson, Neenah, Wis.; F. A. Mohns, Janesville, Wis.; D. J. McLoraine, Davenport, Iowa; C. V. Nygren, Marinette, Wis.; C. C. Eckwert, Clinton, Iowa; M. A. Gehr, Boone, Iowa; S. H. Ashton, Rhinelander, Wis.; L. D. Doscher, Marshfield, Wis.; J. M. Thompson, Eau Claire, Wis.; W. G. Boylan, Charles City, Iowa; O. W. St. John, Mason City, Iowa; H. G. Miller, Burlington, Iowa; J. P. Smart, Kenosha, Wis.; B. M. Foote, Ft. Dodge, Iowa; C. A. Gillette, Marshalltown, Iowa; J. W. Hilliker, Muscatine, Iowa; M. W. Clarey, Estherville, Iowa.

Mr. J. P. Edwards, division traffic superintendent, Chicago, Ill., was a New York visitor over Decoration Day.

Edward F. Wach.

The resignation of Mr. Edward F. Wach as assistant night chief for the Western Union, Chicago, which took effect May 1, deprives the night force of that office of one of their best friends.

Mr. Wach is to devote his entire time to architecture, in which he has been engaged for the past three years.

During his long service with the Western Union, Mr. Wach has always been solicitous and earnest in looking out for the welfare of those under him and is loved and respected by the entire staff who will miss him greatly.

While working for the Great Northern Railroad, some years ago, James J. Hill, the president, remarked of him, that during his stay in a frontier town, "Mr. Wach is the only gentleman in Havre."

His efforts in advancing the interests of the Telegraph and Telephone Life Insurance Association during the past year have been wonderfully successful, a fact due to his popularity with the boys and girls of his office, and the untiring zeal and energy which he displayed in the cause.

His many friends unite in wishing Mr. Wach much success in his new field of endeavor.

A Few More Left.

I have a limited number of copies of my late book, "AUTOGRAPHS AND MEMOIRS OF THE TELEGRAPH," which I will sell at $1.25, post-paid to any address. After this edition is sold, the book will be out of print. Address Jeff W. Hayes, 5355 Glenwood Ave., Chicago, Ill.

"The Last Call."

Mr. William D. White of the Western Union office at Presque Isle, Me., is the author of a poem that has some merit and will appeal to every telegrapher in the country. It is entitled, "The Last Call," and the theme was suggested to the author by hearing of the death of an old friend. The poem contains a lesson that should be profitable to operators.

APPROVED CIPHER CODES. — This publication is headquarters for all telegraph cipher codes, which include the Western Union Code, price $16.00 office size, pocket size $10.00; Lieber's Code, price $12.00; Bentley's Code, price $25.00; Scott's Code, price $25.00, and A. B. C. Code, fifth edition improved, price $15.00. These are the codes authorized by the United States Government and their use will meet the approval of the censors. This publication is headquarters for all other codes and needed information in regard to any of them will be furnished on request. Address John B. Taltavall publisher, TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

MORSE TELEGRAPH RECORDS.—One of the most instructive and entertaining developments in telegraphy is the Morse telegraph record idea. These records can be reproduced on any talking machine, and contain lessons in Morse and wireless, or continental code. The lessons on the Morse discs were made from the sending of the finest operators in the United States, and the reproduction of the wireless sending is perfect. There are eight double discs of Morse, sixteen lessons, and four of wireless, eight lessons. The speed of reproduction can be varied to suit. The full set of eight Morse discs, comprising sixteen lessons costs $8.00; for a single double record disc the price is $1.25. The price of the four double wireless discs is $8.00, or $2.25 for one disc containing two lessons.

For sale by TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

ELECTRICAL INSTRUMENTS AND TESTING.—We are frequently asked about the methods employed for testing telegraph lines for crosses, insulation, grounds, etc., and we invariably recommend Schneider and Hargrave's book, entitled, "Electrical Instruments and Testing." It is written in a very clear style by practical men for practical men. Mr. Jesse Hargrave, who wrote the chapters on testing, is a well-known telegraph engineer, and what he says on this subject is worth much to those whose duty it is to test wires, and to those who hope to occupy such a position in the future. The price of this book is $1.15 per copy, which is a remarkably low price for so much information. Copies may be purchased of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

LETTERS FROM OUR AGENTS.

New York Western Union.

The bonus which the company is about to distribute among the employes in this office will be largely invested in Liberty Bonds and placed to the credit of the depositors in the Serial Building Loan and Savings Institution. When the bonus was announced by the company it spurred the subscriptions to the Liberty Loan considerably. Approximately over twelve hundred people in the New York main office have subscribed an amount almost equal to one hundred thousand dollars.

The following is the programme of the subjects to be considered at the meetings of the Western Union Educational Society of New York during June, July and August: June 27, "Circuit Layouts," by C. M. Mason, engineer, in the office of the vice-president; July 11, "Commercial News Department," by H. M. Heffner, assistant chief operator in charge of that department; July 25, "The Multiplex System," by R. F. Drehner, division traffic inspector of automatics; August 8, "The Clerical Department," by W. R. Taylor, chief clerk, main office; August 22, "The Employment Bureau," by Miss L. M. Park, employment department supervisor of this office. The lecture scheduled to be delivered by Mr. C. W. Frey on May 31 was postponed to June 13.

The following changes, effective June 1, were announced by Division Traffic Superintendent S. B. Haig: W. T. Rogers, formerly division wire chief and division traffic engineer, has been appointed division wire chief of the Eastern Division; L. C. Boochever has been appointed division traffic engineer; E. D. Pitt, formerly chief clerk to Mr. Haig, has been appointed division traffic supervisor.

The Educational Society gave a theatre party on June 14 at the Lexington Opera House. Over five hundred members, including their families, were present. An excellent bill was enjoyed. The proceeds will be devoted towards equipping several baseball teams in the Western Union Educational Society's league of New York City.

Marriages.—E. D. Pitt, the newly appointed division traffic supervisor and Miss Catherine O'Neil.

Mr. P. J. Tierney, cable agent for this company, at 20 Broad Street, New York, has been appointed a Lieutenant of the United States Naval Reserve, by President Wilson. Mr. Tierney is one of the best-known cable authorities in the United States. He has been in the Western Union Service since 1871. Under his command are Ensigns J. F. Carter, R. T. Sullivan and E. M. Duncan.

Boston Western Union.

Telegraph and Telephone Age will be represented in this office by two agents instead of one as formerly. W. T. Budds, who has acted in the capacity of agent, will hereafter be assisted by W. I. McFatter. Both of these gentlemen are well known to the fraternity at the Hub. They expect those who have orders to place will not overlook the fact that they can obtain through them at the shortest possible notice anything that they may require in the line of educational books, subscriptions to this or any other publication, and anything else that telegraph people require.

Philadelphia Postal.

The recent severe electrical storms have kept the local plant force on the go.

Natah Broker has been assigned to the first Buffalo, while Joseph P. Collins covers the Philadelphia end of the Cleveland wire.

Miss Elizabeth M. Farrell, formerly of this office, is now located in the telegraph department of David Lupton Co., this city.

Adam Leininger of the printer department has been promoted to be night supervisor. He is succeeded by Leslie Kramer.

THE VALUE OF KNOWING HOW

The control of electricity is one of the easiest of electric problems if the work is done properly, but if the work is not well done the electric hazard is great.

THE NEW YORK ELECTRICAL SCHOOL trains young men to do all kinds of electric wiring, installation, maintenance, etc., in the most approved manner and the work of its graduates always receives the approval of the inspectors and others concerned.

This school is the leading and most up-to-date institution in electric instruction. The student is taught to do actual work while he studies and the combination of practice and theory is well developed.

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Students can enter at any time and there is no limit as to age. *For further particulars address*

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No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fit snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. Address orders to Telegaph and Telephone Age, J. B. Taltavall, Publisher, 253 Broadway, New York.

Telegraph and Telephone Age

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ANY NEWSDEALER in the United States or Canada can obtain copies of TELEGRAPH AND TELEPHONE AGE through the American News Company, New York.

BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, JULY 1, 1917.

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Wireless Telephony in the Navy.

The Navy Department authorizes the following:

Wireless telephony as well as wireless telegraphy will be used by the United States Navy in its war operations. A year ago, by order of Secretary of the Navy Daniels, telephone officials of the Bell system and navy officers planned and successfully carried out a three-day mobilization of communication forces during which war conditions were simulated. Instantaneous communication was provided over the wires of the Bell system by both telephone and telegraph from the office of the secretary at Washington to all the naval stations in the continental United States, and wireless telephone communication was maintained between the office of the secretary and an American battleship in the Atlantic Ocean.

Since that time engineers and scientists connected with the Bell system have been working in close cooperation with officials of the Navy Department and have developed further the use of the wireless telephone in the naval service. The plans followed in the original mobilization have proven in practical operation to be as highly satisfactory as they were at that time.

The telephone and telegraph engineers, whose organizations are all represented on the telegraph and telephone committee of the Council of National Defense, have also been working with the army and naval officials, the National Research Council and the Naval Consulting Board on many research problems of vital importance to national defense, such as telephone communication with airplanes, new wireless methods, and apparatus for detecting the presence of submarines, and important progress has been made.

President Wilson Favors Conventions This Year.

Reference was made in our June 16 issue to the growing sentiment against the canceling of conventions this year on account of the war, and to the fact that President Wilson had been asked by the Merchant's Association of New York, if, in his judgment, the continuation of such meetings would be beneficial. President Wilson has replied that so far as he can see there is no sufficient reason for foregoing the holding of conventions and general commercial meetings by business interests.

How are Your Crops?

While telegraph and telephone companies are doing so much for their employes in the way of extra pay to meet the high cost of living they have neglected to help the employes to take care of their gardens. Many telegraph and telephone men have become real farmers and their sole conversation while off duty is about cabbages, corn, bugs, etc. Their dreams relate to fights with caterpillars and other pests, and in their waking hours they picture in their minds luscious corn, onions, beets and independence. The companies should offer prizes to their agricultural employes for superior products of the soil.

As many employes are so saturated with the farm and garden idea, they have acquired a real farmer drawl in their conversation, and use such expressions as "by heck," "gol darn," etc.

Here is some advice taken from a paper which is not a farm journal: Plant peppers, tomatoes, potatoes, cabbages, poison potato beetles and slugs; plant cucumbers for pickles, etc.

We hope the courage of these farmers will not falter, and that their crops will be abundant and repay them for their labor and time.

In Favor of the Associated Press.

In an opinion handed down by the United States Circuit Court on June 22, the Federal District Court is instructed to issue an injunction restraining the International News Service from taking any of the advantages charged by The Associated Press as unfair, including the copying of bulletins or the taking of Associated Press news from early editions of newspapers to be sold over the International News wires as its own news. The International News Service will take an appeal to the United States Supreme Court.

Telegraph and Telephone Patents.

ISSUED MAY 22.

1,227,474. Telephone System. To T. G. Martin, Chicago, Ill.

1,227,521. Wireless Telegraph Transmitter. To J. G. Balsillie, Melbourne, Victoria, Australia.

ISSUED MAY 29.

1,227,582. Telephone Exchange System. To H. P. Clausen, New York.

1,227,609. Telephone Exchange System. To C. L. Goodrum, New York.

1,227,895. Telephone Exchange System. To B. G. Dunham, New York.

1,227,932. Automatic Telephone Exchange System. To F. N. Reeves and A. E. Lundell, New York.

1,227,936. Telephone Plug Ejector. To H. B. Rodier, Washington, D. C.

1,228,007. Connector Repeater Switch of Automatic Telephone Exchanges for Handling Fire-Alarm Calls. To J. Erickson, Rochester, N. Y.

ISSUED JUNE 5.

1,228,394. Disinfecting and Advertising Device for Telephones and the Like. To L. Block, New York.

1,228,537. Telephone System. To W. W. Dean, Rochester, N. Y.

1,228,634. Intercommunicating Lockout Telephone System. To F. W. Adsit, Minneapolis, Minn.

ISSUED JUNE 12.

1,229,347 and 1,229,348. Telephone-Calling Registering Device. To V. Thompson, Vancouver, B. C., Canada.

1,229,634. Telephone Transmitter. To R. H. Manson, Rochester, N. Y.

1,229,796. Telegraph and Telephone System. To J. Schiessler, Baden, near Vienna, Austria.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on June 27:

American Tel. and Tel. Co.	123⅛
Mackay Companies	82½-85
Mackay Companies, pfd.	64-64½
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2⅞
Western Union	93

DIVIDEND.—The Gold and Stock Telegraph Company has declared the usual quarterly dividend of one and one-half per cent.

PERSONAL.

MR. WALTER P. PHILLIPS celebrated his seventy-first birthday at Oak Bluffs, Mass., June 14.

MR. E. A. CONRAD, Northern Pacific Railroad Company, Telegraph Department, Livingston, Mont., was a New York City visitor on June 17 and made this, his first visit to New York, the occasion to call on many old telegraph friends. Mr. Conrad was accompanied by his wife.

MR. W. L. JONES, president and general manager of the Postal Telegraph-Cable Company of Texas, Dallas, Tex., was a New York business visitor June 20.

MR. G. M. DODGE, of the Valparaiso Institute of Telegraphy, Valparaiso, Ind., and manager of the Western Union office at that place, was a recent business visitor in Washington and New York.

MR. SETH LJUNGQVIST, chief of division to the Royal Swedish Telegraph Administration, Stockholm, Sweden, was a recent New York visitor. Mr. Ljungqvist has been in America several months, and is now returning home.

MR. AINSLEE A. GRAY, vice-president and general manager of the Electrical Review Publishing Company, Chicago, has severed his connection with that business, and has formed a partnership with Charles L. Benjamin, under the firm name of Gray and Benjamin. The firm will devote its energies to technical advertising counsel to manufacturers of electrical, mechanical, chemical and kindred products, with offices in Chicago. Mr. Gray has had a varied experience and his career is an excellent example of what a progressive spirit can accomplish unaided.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

MR. JOHN J. WHALEN has returned from a visit to the Cleveland, Detroit, Chicago, Buffalo, Philadelphia, Baltimore and Washington offices.

MISS MARGARET CASSASSA, cashier at San Francisco, has resigned to be married.

MR. C. D. RECORDS has been promoted from manager at Tulsa, Okla., to the position of cashier at San Francisco.

A. D. WISE has been appointed chief clerk to Superintendent H. Scrivens, at Pittsburgh, Pa.

MANAGERS APPOINTED.—T. A. Boyle, at Quitman, Ga.; T. A. Scott, Moultrie, Ga.; J. C. Ham, Warrensburg, Mo.; G. H. Frame, Atchison, Kan.

NO FREE SERVICE FOR THE CITY OF OGDEN.—When the Postal Telegraph-Cable Company was granted a franchise in Ogden, Utah, in 1904, it entered into an agreement to furnish $150 worth of free service to the municipal government each year in lieu of an occupation tax for the use of certain streets and alleys. After several years and in 1911 the company refused to provide the free tolls on the ground that it would violate the Interstate Commerce regulation. Judge Pratt, in the district court at Ogden, decided that the city had no cause of action, holding that the Interstate Commerce law prevents the public service corporation from accepting anything but cash for its service.

Farewell to Jed G. Blake.

On May 11 representatives from every department of this company at San Francisco assembled in the general offices to tender a farewell to former general superintendent Mr. Jed G. Blake, who was recently appointed special agent at Chicago. A number of tokens of esteem and good will were expressed by the employes of the Pacific Division. District Superintendent Charles L. Lewis acted as spokesman, and made some very interesting remarks in which he paid a high tribute to Mr. Blake personally, and his work while at the head of the division. Mr. Blake was presented with a leather traveling bag, a traveling toilet set, a silk umbrella and a diamond stick pin.

Mr. Blake was later a guest of honor at a farewell luncheon given by about twenty prominent members of the San Francisco Commercial Club. At the conclusion of the luncheon the various members expressed in person their great regret at Mr. Blake leaving the Pacific Coast. He was presented with a watch chain as a token of their esteem and good will.

V. V. Stevenson, Superintendent, Los Angeles, Cal.

Mr. Vail V. Stevenson, division electrical engineer of this company at San Francisco, Cal., whose appointment to the position of superintendent of the third district, Pacific Division, with headquarters at Los Angeles, was noted in our June 16 issue, is one of the young men of the telegraph into whose hands the great telegraph systems of the country are rapidly centering. Mr. Stevenson was born near Kansas City, Mo., March 30, 1881. He entered the service as a Western Union messenger boy in 1895. By 1899 he had become an operator for the same company at Los Angeles. Subsequently he entered the employ of the Southern Pacific Railroad, later returning to the Western Union as an operator at Phoenix, Ariz., from which he went to Tucson as repeater chief. In 1905 Mr. Stevenson was appointed assistant chief operator for the Postal Telegraph-Cable Company and in the year following received promotion to the managership of the repeater station at Ashfork, Ariz. From this point he was transferred to Los Angeles as chief operator and was made manager of the office November 1, 1908. Later he was appointed division electrical engineer, and his headquarters were transferred to San Francisco. This position he held at the time of his recent appointment.

V. V. STEVENSON.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Western Union to Operate Pennsylvania Railroad's Telegraph System.—This company has closed a contract with the Pennsylvania Railroad Company whereby the telegraph company will handle all of the commercial telegraph business at all of the railroad stations, including privileges for separate telegraph offices in stations in the larger cities. The railroad company owns the telegraph lines along its right of way and the telegraph company will place its signs and blanks in the stations and use the railroad's telegraph equipment at all the offices—in other words, it will add the railroad's telegraph lines and offices to its general commercial system.

Mr. W. T. Davis has been appointed district commercial superintendent at Omaha, Neb., vice Mr. C. B. Horton transferred to Pittsburgh.

Mr. Charles B. Horton, district commercial superintendent at Omaha, Neb., has been transferred to Pittsburgh, Pa., to occupy the position of commercial superintendent of the third district, Eastern Division. Mr. Horton was born in Michigan in 1876. His father was prominent in telegraph circles and at the time of his death a few years ago was superintendent of the Western Union interests at Omaha, his son, C. B. Horton, succeeding him. He began his telegraph career as a messenger at Omaha in 1891 and has filled almost every position within the gift of the company to the district superintendency. He is well qualified to fill the additional burdens incident to a larger district.

The Eastern Division Traffic Department on July 1 will be divided along lines similar to those separating the division into districts. This necessitates the creation of the new supervisor unit and Mr. E. D. Pitt, as announced in the previous issue, was made division traffic supervisor. Coincident with these changes the position of division traffic engineer was separated from the joint position of division wire chief and division traffic engineer. Mr. L. C. Boochever, formerly division traffic supervisor, was appointed division traffic engineer, and Mr. W. T. Rogers, formerly occupying the joint position, has been appointed division wire chief.

Cablegrams to American Expeditionary Forces.—Special arrangements have been made under which cablegrams of a social character may be sent to soldiers, sailors and nurses of the American expeditionary forces in England and France, such cablegrams to be charged on a word basis without a minimum charge. They will be transmitted as traffic conditions permit and will be delivered immediately upon receipt. Similar arrangements have been made for the acceptance of messages from members of the expeditionary forces in England and France to their friends and relatives in the United States. These cablegrams to and from France will be handled by post between London and France. The rates will be five cents per word from New York City.

THE CABLE.

Mr. T. F. Foley, superintendent, Hammels, L. I., has gone to Bay Roberts and Hearts Content as a representative of the assistant traffic manager, New York, and plant engineer, London.

A Multiplex Circuit to Hearts Content, N. F,. started Monday, June 18, and has been handling all the Anglo division New York cable traffic in a most satisfactory manner.

A Long Telegraph Circuit.—New York maintains daily direct communication with Valparaiso, Chile, a distance of approximately 7,000 miles, over the cables of the Central and South American Telegraph Company. This is probably the longest regularly worked circuit in the world.

Cable Station Sentries Shot At.—The sentries guarding the Commercial Cable Company's station at Far Rockaway, L. I., were fired upon by two men, June 24. The intruders, however, made their escape.

A Long Dot.

Some years ago Mr. Thomas A. Edison took an automatic Morse arrangement to England and in the course of his experiments he tried to pass signals through a cable about 1,000 miles long, coiled in a tank. After the trial he laughingly acknowledged that he had not been very successful, as a dot sent into the cable was twenty-eight feet long when it came out at the other end. "In fact," he added, "I thought that dot was never going to end."

Speed in Cablegrams.

When the first cable was laid dispatches, costing $5.00 per word, passing through to their destination in Europe in anything less than two or three hours were regarded as wonderful achievements. Today there are cable dispatches which must pass through to their destinations in less than two or three minutes or they fail to serve their purpose.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to June 26 as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable) October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917.

CANADIAN NOTES.

GRAND TRUNK PACIFIC.

Mr. H. Hulatt, manager of telegraphs, Grand Trunk and Grand Trunk Pacific, Montreal, Que., recently returned from Winnipeg, Man., having made a trip of inspection over the lines of his company located on the Transcontinental Railway.

Captain S. Stibbard, aged twenty-six years, formerly chief clerk to division superintendent of telegraphs, Grand Trunk Pacific Telegraph Company, Winnipeg, Man., was in a recent casualty report from the front reported missing. The hope is expressed that he will subsequently be reported as a prisoner of war.

Samuel Hutchinson of Winnipeg, Man., died June 10. Deceased was identified with the commercial and railway telegraph system of Western Canada for upwards of thirty years. He went to Winnipeg from Toronto to take over the managership of the Great North Western Telegraphs in Winnipeg in 1890. Subsequently on the inauguration of the Grand Trunk Pacific Telegraph Company's service he transferred his allegiance to that company, assuming the position of city manager at Winnipeg. He was afterwards transferred to Prince Rupert, B. C., on the inauguration of commercial service by the Grand Trunk Pacific Telegraph Company on the Pacific Coast. Mr. Hutchinson returned to Winnipeg in August, 1916, as circuit manager over the Central Division, which position he held at the time of his death.

New Canadian Press Association.

The Canadian Press, Ltd., in annual meeting at Toronto, Ont., June 13, unanimously adopted the plan for the Canadian National News Association which had already been approved of by the existing Canadian cooperative news gathering and distributing organizations.

Mr. Melville E. Stone, general manager of the Associated Press of the United States, who was present, congratulated the publishers and the people of Canada on this great forward step towards national unity and solidarity, pointing out how the proposed system of leased wires from coast to coast, day and night, would tend to bring all parts of the Dominion into the closest association.

Directors for the ensuing year were elected as follows: John Nelson, British Columbia; J. H. Woods, Alberta; W. F. Herman, Saskatchewan; E. H. Macklin and R. L. Richardson, Manitoba; J. E. Atkinson, W. J. Blackburn, J. H. Chevrier, C. F. Crandall, J. F. Mackay, E. Norman Smith, J. Ross Robertson and E. F. Slack, Ontario and Quebec; E. W. McCready and G. Fred Pearson for the Maritime Provinces.

E. F. Slack was elected president, E. H. Macklin first vice-president, W. J. Blackburn, second vice-president, and C. F. Crandall, secretary-treasurer.

C. O. Knowles, manager of the Evening Paper Section, was appointed general manager of the new organization and J. F. B. Livesay, assistant general manager, with headquarters at Winnipeg.

Under the new arrangement there will be a 24-

hour daily leased wire service for news between Halifax and Vancouver, with extensions to Sydney on the east and Victoria on the west, and a loop to Seattle.

In addition there will be a second wire between Montreal, Ottawa and Toronto to carry the bulk of the Canadian news, including a report of the proceedings in parliament from a news bureau to be established in the capital.

The location of the head office was left to the discretion of the general manager for the first year.

THE TELEPHONE.

MR. ANGUS S. HIBBARD, a director of the Chicago Telephone Company, was painfully injured May 30, when the automobile he was driving was struck by a passenger train near the Glen View Golf Club. The locomotive struck the rear of the car and threw it, with Mr. Hibbard, a distance of about fifty feet, into a ditch. Mr. Hibbard's injuries consisted in cuts and bruises.

DIVIDEND.—The American Telephone and Telegraph Company has declared a quarterly dividend of two dollars per share.

Origin of the Telephone Pony Press Report.

The first "pony report" was probably one started in Indianapolis in April, 1908, when a regular service was sent by telephone to the Terra Haute, Ind. *Post,* says Mr. Charles Speaks in the *Telephone Review.* Kent Cooper, now at the head of the traffic department of the Associated Press, conceived the idea of using the telephone to supplant the old "telegraph pony reports." At the time Mr. Cooper was correspondent in Indianapolis for the United Press. He discussed his plan with W. E. Bell, then commercial superintendent of the American Telephone and Telegraph Company in Chicago, and they decided to come to New York to "talk it over" with C. H. Wilson, then general superintendent of the American Telephone and Telegraph Company. Mr. Wilson, now general manager of the company, saw the possibilities of a regular telephone news service and agreed that it should be tried out. The first circuit was soon in operation and a short time afterward "pony" circuits were established in various parts of the country.

At the present time the five hundred or more daily papers on the telephone circuits, or "PNT" (public news telephone) circuits receive every day from one thousand to ten thousand words each of news gathered from all parts of the world.

In most of the larger cities, including Chicago, Philadelphia, Boston, St. Louis, Cleveland and a score of others, offices are maintained to relay news by telephone to the smaller cities.

The telephone news service is used for both morning and afternoon newspapers and many of them carry the line "By long distance telephone" over their news stories.

The "pony" services have had a good, healthy growth ever since they were started, and newspaper men in a position to know say that the future will bring a more widespread use of the telephone as a distributor of news.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager, is spending his vacation in the Adirondacks at the Lake Placid Club where his family is summering.

Mr. Lewis MacCommach, private secretary to the third vice-president, has been elected assistant treasurer of the Marconi Wireless Telegraph Company of America.

Mr. J. de Jara Almonte has returned from Central America, where he has been for nearly a year looking after Marconi interests.

Mr. Harry Shoemaker, research engineer, has resigned to engage in other business.

SIGNOR GUGLIELMO MARCONI made an address on the war conditions at the luncheon given by the Merchants' Association, New York, June 22, to the Italian Royal Commission now in this country to discuss war problems.

LARGE SPARK COIL.—A spark coil with a core over twenty feet long and about three feet in diameter was installed at the station of the old Pacific Wireless Telegraph Company on Mount Tamalpais, Cal.

Examinations for Radio Clerk and Bookkeeper.

The United States Civil Service Commission will hold a competitive examination on July 25 for radio auditing clerk and radio bookkeeper and accountant at the usual places. Entrance salaries for auditing clerks range from $1,000 to $1,400 a year and the salary for bookkeeper and accountant $1,500. There will also be an examination for assistant bookkeeper and accountant at $1,000 per year.

Wireless "Hams"

They have poor, jerky senders in the wireless service as well as on land wires, and this fact caused a wireless operator considerable trouble, mental and otherwise, during his first voyage along the Pacific Coast. He received an S O S signal and endeavored to ascertain the name of the ship sending it. He could get no reply and when he got back to shore he reported the matter and was informed by the superintendent that there had been no S O S signals at the time mentioned but that a message bearing the Greek name "Hyksos" had been transmitted from a near-by liner to a coastal station. The liner's operator, being a poor sender, spaced the last three letters of the name so that the receiving operator mistook them for the regular signal of distress.

The Future of Wireless Telegraphy.

In an article in the *Wireless World,* on the future of wireless telegraphy, Professor J. A. Fleming, the eminent English scientist, says that in the development of practical wireless telegraphy we shall probably see in the near future progress made on lines analogous to the great improvements in telegraphy with wires connected with multiplex printing telegraphs. The Baudôt multiplex system and its outcome, the Murray multiplex and Western Union multiplex, enabled twelve or more messages to be sent simultaneously along a single wire, and the receivers print down the messages in Roman type on slip or page form. The transmitters are operated by keyboard typewriters, which prepare punched tape for automatic transmission. Some progress has been made toward such automatic transmission by the use of Creed transmitters, and Senatore Marconi's very practical method of duplex transmission in the case of long-distance stations opens the way to still further achievements in the establishment of quadruplex wireless telegraphy which might quite easily be established. Indeed, sixteen or seventeen years ago diplex wireless telegraphy was accomplished in Mr. Marconi's experimental station at the Haven Hotel, Poole, when two messages were received and sent simultaneously in the same direction.

As soon as peace restores the possibility of fresh invention we may look forward to a great advance in automatic sending and printed-message receiving in connection with long-distance wireless stations. Up to the present wireless work has been conducted in International or American Morse code, but the five-unit Baudôt alphabet is the basis of all modern machine printing telegraphs. It is not impossible that future wireless work may be conducted with five antennae at each station, each radiating or receiving one unit of a letter at a separate wave length, the whole letter being signalled and received simultaneously and recorded instantly as a printed letter on tape or page ready to be handed to the recipient.

In wireless telephony we are still in the experimental stage, and await the invention of improved and more certain methods of generating undamped oscillations than those depending on the use of the electric arc. Some modification and simplification of the frequency-raising method employed in the Goldschmidt alternator would seem to be the best solution unless a conductor can be found other than the electric arc having a steep descending characteristic curve.

OBITUARY

J. A. Fuller, a military telegrapher during the Civil War, died at Clearwater, Fla., May 11.

Locke L. Lowry, an operator of Dallas, Tex., died in that city, June 18. He was a native of Mississippi and a son of former Governor Lowry of that state.

Jerry L. Newton, aged seventy-two years, a well-known operator and a poet of some note, died in San Antonio, Tex., May 31. He was retired in July, 1911, after a service of upward of forty years with the Western Union Telegraph Company. Mr. Newton was formerly and for many years manager of the San Antonio office. When quite young he entered the Union Army in 1862 and was captured and made a prisoner of war by the Confederates, being sent to a stockade prison near Tyler, Tex. He made his escape but was recaptured. He was exchanged in 1865 and returned to his command, and soon afterward was wounded. He taught a country school and was a justice of the peace in 1866 and 1867. Mr. Newton entered the Western Union service in 1868.

The Late A. W. Copp.

A. W. Copp, whose death in Washington, D. C. June 12, was announced in our June 16 issue, began his newspaper experience with the Associated Press nearly twenty-five years ago, first as a telegrapher. He represented Telegraph and Telephone Age in San Francisco and he gave this paper credit several years ago for the start in his newspaper career.

He was a live man in the newspaper service and obtained successive promotions until he was selected to represent the Associated Press as its superintendent of the Southern Division at Washington. He was at one time manager of the Western Division of the association at San Francisco.

When the Associated Press asked for a volunteer to go to Europe aboard the American Line steamship "St. Louis," the first armed American ship to pass through the submarine zone, Mr. Copp offered his services. He came back to America on the return voyage of the steamship, but soon after his arrival was taken ill.

Aboard the "St. Louis" on her voyage through the submarine zone Mr. Copp was ill, but he encountered the danger bravely throughout the two days and two nights that the vessel travelled in the zone, and he remarked on landing at a British port that he was sorry there had not been some excitement.

The voyage of the "St. Louis" required nine days, during which the few passengers had no wireless news—nothing, in fact, to think of but the possibilities of being sunk. In order, as he put it, "to stir things up a little," Mr. Copp suggested that a newspaper without news be printed aboard the vessel. The four other newspaper men aboard contributed articles and a handbill size newspaper, called the *St. Louis Periscope,* was produced,, the articles dealing with incidents that happened aboard, with jingles about life preservers and other subjects, treated in a humorous vein. *The Periscope,* at the suggestion of Mr. Copp, was sold at twenty-five cents a copy for the benefit of the Red Cross.

Mr. Copp represented the Associated Press in Cuba during the Spanish-American war. Later he saw service as a correspondent along the Mexican border. The cause of Mr. Copp's death was Bright's disease.

Sources of Electric Current for the Operation of Telegraph Lines.

There are more methods of generating electricity for the operation of telegraph lines than there used to be years ago.

Main line batteries are used in small offices and in larger places where no source of power is available for driving motor-generators. Gravity batteries are used for locals in almost all smaller offices, even in some cases where motor-generators are employed for main line operation, when the number of locals is so small that a special generator would not be economical. Storage batteries are used to some extent for main line work.

Where the supply of electrical power is constant and reliable motor-generators are preferred for places where they can effect economy.

"Who Struck Billy Pattison?" and Another Tale.

Chas. M. Holmes, executive office messenger of the Western Union Telegraph Company, New York, for over a quarter of a century, who retired from active service a few years ago, occasionally calls on old friends along the telegraphic lane. Mr. Holmes was one of the characters of the profession. He is brim full of good stories. Here is a sample of what he had to relate on a recent visit:

One day when Gen. Thomas T. Eckert and I were signing stock certificates (he was signing them and I blotting them) I asked him in the course of conversation where the body of J. Wilkes Booth, the assassinator of Abraham Lincoln, was buried. The General laid down his pen, turned and looked at me very seriously and said "Holmes, who struck Billy Pattison?"

I said, "That has always been a mystery." The General said "In those words you have your answer." General Eckert and two other government officials were the only persons who knew what disposition was made of the body of J. Wilkes Booth and not one of the three could ever be induced to reveal the place of interment.

About the time of the assassination of President Garfield there was a clerk in one of the executive offices of the Western Union Telegraph Company who had a fad or, I might say, a mania for collecting autographs and would overcome any obstacle to get one. At that time the *New York Herald* daily published the arrival of distinguished personages and the name of the hotel at which they stopped. In scanning the list (a daily habit) our friend saw the name of a man of whom it was said no one ever had or could obtain his autograph.

Other friends, knowing this, decided to play a joke on the collector of autographs. They went to the hotel, secured one of the hotel envelopes, and taking a plain card one of the men wrote with a tooth pick the name of this stranger, enclosed it and addressed it to the autograph fiend at 195 Broadway.

Of course the recipient was delighted and proudly exhibited it with the remark, "No one could have got this but me."

It is believed he remains unenlightened to this time. The collector of autographs is now connected with one of the most prominent magazines of the day.

INDUSTRIAL.

New Lockout System.

The Railway Electric Manufacturing Company of Milwaukee, Wis., has improved its "Remco" selector mechanism (which has been operated on some of the foremost roads of the country with such signal success) to function as a "lockout."

As many as twenty substations can be maintained on a single circuit, and the central station can select any station by local bell ringing, to the exclusion of all the other stations.

Normally, all station telephones are in circuit, so that central can be reached at any time, but it is within the control of the central operator to cut out all stations from listening when he desires to have a confidential talk with any one station; or he can hold one station on the line while calling and speaking confidentially with another station, and, by the mere pressing of a button, let the first station in, when a three-sided conversation can be had if desired.

This system bids fair to meet with considerable commercial favor, especially where it is desired to build private lines, or to lease telephone or telegraph wires, and installing drops into various stations along the line, for the purpose of supplying confidential market news and prices.

The "Remco" selector, operating on alternating current, permits the use of iron telegraph circuits for telephone use, without interfering with the transmission of Morse.

It is also possible that railways may favor this lockout for use in train dispatching, since it prevents "listening in" and getting orders confused.

A Useful Book of Tables and Wire Information.

The John A. Roebling's Sons Company, Trenton, N. J., has just issued a very handy and useful book giving a large variety of tables and wire information which will be found very useful by electrical men. It covers tables of weights and measures; the metric system, and gives many conversion tables. It is a book that will find ready and frequent use by all electrical concerns and telegraph and telephone engineers.

THE TELEGRAPH AND TELEPHONE LIFE INSURANCE ASSOCIATION has levied assessments 622 and 623 to meet the claims arising from the deaths of W. F. Gessner at Philadelphia, Pa.; H. Morot, New York; J. F. Seery, Albany, N. Y.; J. G. Force, Chicago; J. M. Sullivan, Brooklyn, N. Y.; B. F. Dancer, Corinth, Miss.; H. L. Miller, Tampa, Fla.; P. H. Burns, Grand Rapids, Mich.; J. R. Cobourn, Paducah, Ky.; H. L. Waterbury, Saratoga Springs, N. Y.; J. B. Holle, Koch, Mo.; W. M. Goodridge, Glendale, Cal.

A THRIFTY SPARROW.—A sparrow built its nest in a telephone cable terminal in Charlestown, W. Va., using as part of the domestic equipment a one-dollar greenback. Even birds are showing thrift and lay up for the future.

SMALL CONDENSER PLATES.—Small condenser plates are more efficient than large ones of the same capacity, because the small ones discharge more rapidly.

Mr. Wm. Maver, Jr., the well-known old-time telegrapher and electrical engineer, in remitting to cover his subscription for another year, writes: "I wish again to express my high appreciation of every copy of the AGE that I receive. The items of technical information on telegraphy and telephony are always well selected and the personal news of the whereabouts of and happenings to old telegraph friends are very welcome to me."

How an Early Telegraph Line Was Worked.

There is always a charm to a story, a real authoritative story, of how they used to do things in the early days of the telegraph. The following account of some of the trials and experiences of the operators on one of the early telegraph lines (in 1846) makes highly interesting reading in these days of quadruplexes, multiplexes, etc., and gives us an insight into the crude ideas of the early days and the methods of operating the lines. It is a wonder the wires worked at all, so utterly raw were the means employed.

This story was read at the meeting of the Old Time Telegraphers' Association held in New York City, August 20, 1885, and although thirty-two years have elapsed there is in it a freshness of detail that will be highly enjoyed by twentieth century operators. Mr. C. C. Haskins, the author of the article was a leading electrician in his day, and did much important work toward the development of the telegraph.

Commencing telegraphy at the age of nineteen years, in 1846, said Mr. Haskins, was quite a different thing from accepting the position of operator today. There were no chiefs, no circuit managers, in those days; there was not even a night trick, for a telegrapher or a battery man who was not out of his office, his day's work done, by nine or ten o'clock at the most, was looked upon as either very hard worked or extremely lazy, and in either case to be pitied.

Early in the year mentioned, the firm of Livingston and Wells contracted with the projectors of the work to build a line from New York to Buffalo, along the line of the Hudson and the New York Central. The project was so new, however, that throughout the western portion of the state there was much skepticism as to the possibility of a telegraph line being successfully operated to make it commercially profitable. There were grave doubts in the minds of capitalists whether an electrical current could be depended upon to correctly record in what was looked upon as a faulty alphabet a veritable translation of a written message, and the likelihood of error in transcribing from these ambiguous dots and dashes—or, as they were sometimes called, "strokes and pips"—was another serious objection to its possible usefulness. This feeling was so universal among those who were importuned to take stock and risk their money in the new enterprise, that it was finally thought best to construct a sample line in the western portion of the state which would demonstrate the feasibility of the electric telegraph.

The route selected for this general exhibit lay along the old one-horse railroad from Buffalo to Lockport—a road run, by the way, with apartment cars, like coach bodies; a group of three of these built together, with entrances at the side, the seats ranged crosswise of the track, being one car.

Upon this line, which was strung with the softest of copper wire, of about No. 4 gauge, an insulator about the size of the present pony was used, the single wire being fastened by two half-hitches in the wire. The ductility of the conductor rendered it necessary to be constantly taking up the slack, which was done by winding the wire around the insulator. This elongation of the line, which was by no means equal at all points, produced a unique looking insulator at times, when several of these turns were wound upon the glass.

Two offices—the terminals—were opened with a grand flourish of newspaper articles, and wonderful was the result of the announcement. From morning till night the Buffalo office was crowded with sightseers, who were constantly importuning the operator (I think it was Swan) for a piece of the paper, "and please mark the letters, so I can read it," was so frequently an accompaniment that this marking became the rule, rather than the exception, where samples were handed over the little railing that separated the wonderful artist from the ignorant horde without.

Complimentary messages of every description were sent between the two towns, and in most instances the papers, with the cabalistic characters translated, were delivered with the message, as proof of the genuineness of the—I had almost said "despatch." We called it a "communication" in those days.

While this was amply sufficient in the case of a merely complimentary despatch where there was no money at stake, further corroboration was required when it came to business, and I know personally of one instance where a flour commission man wrote an order for a shipment, which he sent by mail, and duplicated by telegraph, after having dropped his letter in the post-office.

The instruments used, if wonderful then, would be curiosities now. The key was a sort of camel-back institution, weighing complete nearly half a pound, and I don't know but nearly a pound. It was clumsy in the extreme. The anvil was disconnected and required to be fitted into a hole nearly an inch in diameter through the heavy plank table at which the operators stood. The register had three pen points to avoid any possible error which might arise from a lump or a hole in the paper. An ingenious arrangement of pins on one of the train wheels made contact with a bell hammer, and at the same time relieved the fly-wheel of a friction brake, so that a short succession of dots made by the operator set the register going, without the necessity of calling or attending to the paper until it was convenient to do so. This was looked upon as wonderfully convenient, and it was considered a great accomplishment. But it had its drawbacks, for in order to be ready at all times for work it was necessary to use the closed circuit system, which was impossible without great waste of battery, and our batteries were expensive. The sulphate of copper battery had not yet been invented, and our motive power was generated by the Grove combination, which rapidly deteriorated, and the nitric acid soon ate up the zincs.

Our relays were a heavy factor, too, in the problem. These contained eight coils, set up in pairs, the armatures arranged like the letter X, with the perpendicular shaft through the center of the cross. Attached to one of these arms was the retractile spring and on another was the local connection.

The relay complete weighed about twenty-one pounds.

The battery was all taken down at shutting-up time, the porous cups emptied into a demijohn, which was carefully corked to prevent deterioration during the night. The zincs were carefully washed and brushed, and any which were in the least oxidized were boiled in dilute sulphuric acid and re-amalgamated. In the morning a mixture of one-half fresh and one-half of the previous day's nitric acid was used for setting up the battery. There was no battery man. The duty of attending to the cells devolved upon the operators, who all, save the manager, took their regular turn, where there was more than one person in the office.

The rapid running down of the battery when on closed circuit, rendered it necessary that some means be devised by which this could be economized. To accomplish this it was an imperative rule that whoever received a message became the custodian of the circuit, and must hold it until the line was wanted by another office. This holding consisted in making occasional dots. Half an hour or even more was by no means long to hold circuit, especially at about noon. Any operator wishing to use the line had only to open his key, which at the next close of the key keeping circuit told the story, and relieved the circuit holder.

Among the abbreviations which all apprentices were compelled to learn were four, s f b, s f d, s f s, and s f n, indicating stop for breakfast, dinner, supper and night, and these we were compelled to use. One operator whom I knew on the Canadian line, whose office was often hard to raise, was recommended by the superintendent to add a fifth to this list s f f, stop to go fishing.

The use of any one of these four abbreviations was an exception to the general rule that where any operator broke circuit he became its keeper, and at about twelve o'clock it was not infrequent for operators to pitch upon some individual, and to use a modern phrase, give him a roast. To do this it was only necessary to call him up and ask the time. Upon his answering, one after another along the line would chip in with s f d, and the poor fellow would be elected to make dots for a long hour, with not a soul on the line but himself.

With the introduction of the Daniell, or sulphate of copper, battery this great drawback to the enterprise was removed. Previous to this, however, an attempt was made to utilize the office clock for this duty, but the application proved a disgusting failure on one occasion when the office was left alone while the clock was performing this duty, for which the brilliant inventor received anything but commendation from the superintendent, Sam Porter, who wanted the circuit badly, but could not make the clock understand the situation.

When the line was to be connected through Lockport to Canada, the operator could not be made to comprehend how the line could possibly work without his ground wire, and it became necessary to send a man from Buffalo to remove the Lockport ground.

All repairs were done, as a rule, by the operators, except where the breaks were near the terminal or larger offices. These were of a temporary character usually, and were subsequently made permanent by linemen. In small offices, the office was locked up, a notice posted on the window or door, and the operator and his girl went out on line with a buggy or light lumber wagon, as facilities permitted. On lines of railroads, the repairer usually had a three-wheeled hand-car, which had occasionally to make rapid time ahead of an engine run by a mischievous engineer. We all had a chance at these races on the New York Central in the early days.

In the sparsely inhabited districts, the operator, unused to climbing, before the days of spurs, when an ascent of the pole was imperative, made the best bargain possible with some country lad, who climbed the pole, or two perhaps, to drop the wire so that a connection could be made, and the loop thus formed usually hung until the next trip of the regular repairer, who carried a ladder and other tools in his wagon.

The line from Queenston, Canada, to Lockport, ran through the Cattaraugus Indian reservation. On the occasion of a break in the single wire, it became my duty as operator at the former office to foot it over the line in search of the trouble. It had been broken close to the Indian village, but a patriotic native had mended the break by tying in a piece of clothes-line.

As the public became more familiar with the "new improvement," as it was sometimes called, additional lines were strung, the old copper wires were replaced by iron, repairing became a more difficult matter, and the operators were only too glad in the majority of cases to give up the work, which was done by better hands.

Then came opposition. Bitter fights and ill-feeling between rival companies descended from employer to employe, and open war was in some instances the result of factional pride. One instance of the extent to which this was carried may serve to illustrate the ingenuity with which methods were invented to down the opposition.

In a small town in Michigan two operators had long contested for the small business of the place. The office of the younger operator was fast losing the custom of his former friends, who had been estranged from him by the oily tongue of his opponent. "Since I am maligned and abused in this way," thought he, "nothing but a bit of strategy will help me out of my dilemma. One Saturday night, after both offices had closed, he entered the office of the other company, and with a fine wire stripped from an old relay he made cleverly concealed connections from the window on either side to the zinc beneath the stove. This zinc was in two pieces, without metallic connection. The cracks in the floor and down the casement completely hid the wire. Now, when the operator stirred his fire and threw the poker on the zinc so as to bridge between the two pieces, his relay was cut out. This action was so irregular as to make the trouble exceedingly difficult to find, but of sufficiently frequent occurrence to effectually prevent the handling of business promptly and the result was eminently satisfactory to the strategist and his employers.

Efficiency Engineering in the Telegraph Service.

(Continued from page 275, June 16.)

As in all other business, there are many misfits in the telegraph service. Men occupy positions which bring them in contact with the public and they are not qualified in any sense of the word to have dealings with the average business man of today. They are unfitted for the task by nature. It is no fault of theirs. They are simply misfits. This does not mean that they are not capable men or that there are not positions that they could fill with honor to themselves and the company.

Our attention was recently called to a serious blunder made by a manager who was called upon by one of his former employes who had gone West fifteen years previously, had made good, had become wealthy, and was on a visit to his old home. It was natural that he should pay his respects to his former manager. When he met his old employer this is the way he was greeted: "Well, what do you want, a job or to borrow money?" "Neither" was the reply and the former employe walked out of the office indignantly. He had become a man of influence and the manager was soon made aware of the fact that he had made a grievous mistake and one that could not be very well adjusted. The manager was simply a misfit. He had misjudged. In the first place he had no right to accost any individual in such a brutal manner. He was totally unfit for the position he held. It is fair to assume that an individual of this type would treat his employes in the same manner. In fact, this sort of treatment had become second nature to him. In the instance mentioned it had at least cost him a good dinner.

Most any high official realizes that he has a percentage of subordinates who are not properly placed and to him it is a perplexing problem to readjust and assign them to positions where they will render the best service.

Many years ago a telegrapher in a city located in New York state resigned to enter the ministry. After he had been relieved of his telegraphic duties he was persuaded by a friend to become a partner in an electrical concern, which in later years became one of the leading industries in the electrical field. The man who thought himself best fitted for the ministry had the name of driving some very hard bargains with inventors. It is to his credit that he purchased for a mere song, so to speak, inventions of great value. How would it have been possible for such a shrewd business man to have graced the pulpit, where charity is the cardinal principle?

A man who has been trained in a telegraph operating room as a rule does not make the best of managers unless he has first been disciplined in the minor positions in the business office. An electrical engineer who is constantly endeavoring to solve intricate electrical problems is also usually unfitted to occupy the managership of a large office, which naturally brings him in contact with alert and enterprising business men.

A manager should have a thorough training in all departments comprising the local executive or business offices of a company. If he starts his telegraph career as a messenger, his first advancement should be to the position of delivery clerk. This brings him in contact with messenger boys, which necessarily sharpens his wits and prepares him for the greater things in life. His next promotion should be to the receiving clerk's desk. Here he meets the public and the rough edges of his human nature are polished off. He is compelled to greet every customer with a pleasant "How do you do," a "good morning," or a "good afternoon." In brief, he is taught politeness. He will absorb the good qualities of those who visit his desk to transact business with him and he will naturally observe the weaknesses of those who are irritable and seem to take a delight in finding fault with everything and everybody. He is in a position to study human nature in its various forms. If he profits by the opportunities he may not know it, but he is qualifying himself for better positions.

The average manager of a telegraph office is looked upon by the community at large with respect. The mayor very often remembers him when he has honors to bestow. The governor calls on him to perform some occasional duty for the benefit of the state at large. Every business man not only respects him but honors him, and he is placed in the same class with the officials of banks. He is trusted with the secrets of the business community as the banker is trusted with its funds. At the same time the manager of a telegraph office is like the officials of a bank in many other respects. He must use discretion. He must not show his political bias if he has any. He must not be a party in a controversy in which his company's interests would be affected. He must keep aloof from all public movements where one class is arrayed against another. He must in a sense, like the banker, live in an atmosphere of his own. If he were free to mingle and do as he pleased he would make enemies for the company and a loss of business and revenue would result.

A manager who takes sides in disputes of any kind soon comes to grief. He should be neutral or passive on all questions in controversy. If he is a strong democrat his Republican customers will not like it. If he is an ardent Republican his Democratic customers will object. Therefore, a model manager makes life's burdens easiest when he plays the part of a gentleman at all times and minds his own business. *(To be continued)*

THE SALVADOR EARTHQUAKE.—After the recent earthquake, which did so much damage in Salvador, the telegraph very quickly got the news to the outside world. The telegraph service in Salvador has been greatly modernized in late years and it is now under the supervision of men who received telegraph training in America. Messrs. Fidel Villacorta and Victor M. Escobar, of the government telegraph and telephone service in Salvador, studied modern telegraphy and telephony in this country and returned home about a year ago. They were sent here by their government for this purpose and they readily acquired a knowledge of the latest developments in these arts, which has been adapted to their country's needs.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

Cells in Opposition.—In Fig. 1 is shown a set of six cells, two of which are placed in opposition, as regards their poles, to the other four. This figure may be used to illustrate what is termed counter-electromotive force. It will be seen by reference to the arrangement of the positive (+) and negative (—) signs over the cells, that cells one and two are opposed to cells three, four, five and six. The effect of this is that the electromotive force of cells one and two offsets, or neutralizes, the electromotive force of two of the remaining cells, and, as a consequence of this opposing or counter-electromotive force, the available or effective electromotive force of the circuit is only equal to that of two cells, or two volts. And, since each cell in the circuit retains its usual internal resistance, the current flowing in the circuit of the six cells, when thus arranged, will be $\frac{2}{12} = \frac{1}{6}$ of an ampere, as against one-half ampere when the cells were connected in straight series.

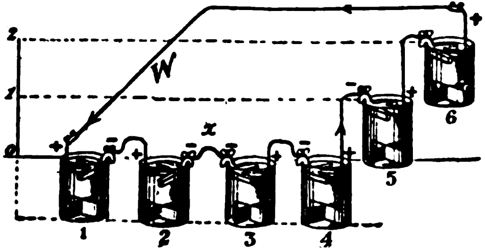


FIG. 1—TWO CELLS IN OPPOSITION.

Further, if in Fig. 1 (June 1 issue) the wire *W* be severed, no current will flow in the cells, inasmuch as the six volts of row *x* will oppose the six volts of row *y*, thus presenting an equal potential, or pressure, at *A* and *B*, and thereby preventing any tendency to a flow of current between those points; the flow of current, as already stated, depending on a difference of potential or pressure.

In all of the foregoing it has been assumed that the resistance of the connecting wires *W* is so low as to be negligible, when in practice this is not the case; the resistance of those wires must be included in calculating by Ohm's law the resulting strength of current.

(To be continued)

QUESTIONS IN TELEGRAPHY.

How may counter-electromotive force be illustrated in the coupling-up of six or more cells of battery?

In a series of six cells, what will be the effect on the total voltage if two of the cells are so connected that they will oppose the current from the other four, that is, if the positive pole of one cell is connected to the positive pole of the next cell, and the negative pole of the second cell is connected to the negative pole of the adjoining cell, as shown in the illustration, Fig. 1?

What will be the value of the current delivered under such an arrangement?

Telephony.

THE FUNCTIONS OF CONDENSERS IN TELEPHONE CIRCUITS.

Every telephone makes use of two kinds of electric current—direct and alternating. A direct current is one which flows constantly in one direction. An alternating current, on the other hand, changes its direction constantly, flowing with a pressure which varies from zero to maximum in one direction, then back through zero to maximum in the opposite direction. The direct current supplies energy for the talking circuit, while the alternating current is used to operate the ringer of the telephone.

When the receiver of your telephone instrument is on its hook, the talking circuit is "open," that is, the direct current is not flowing through the talking parts of your telephone, but the pressure is present in the wires connecting you with the central station, so that taking down your receiver may close the talking circuit, permit current to flow, and place you in instant communication with the operator. The alternating current is only sent over the wires when central wants to operate your ringer. But the ringing circuit must be kept constantly "closed," so that central may signal you by turning on the alternating current. Now, inasmuch as both the ringing and direct currents pass through the same pair of wires, to save duplication of the circuit, the talking and ringing parts of your telephone are directly connected. It is obvious, therefore, that the direct current pressure, which is always present in any subscriber's circuit, will tend to cause current to flow through the ringer even when the talking parts of the instrument are not in use. The ringer, being adapted only to alternating current, would not operate under such circumstances, but this constant flow of direct current would cause a great waste of electrical energy, which in a large exchange would be very expensive.

It is necessary, therefore, for the telephone to be equipped with some device which will keep the talking circuit out of the ringer.

This device is the condenser. It is used for a number of purposes in telephone practice, but one of its most important functions is the one just mentioned, i.e., to keep direct current from constantly flowing through the subscriber's line when the receiver is on the hook, while still allowing, at all times, the passage of alternating current to the bell or ringer.

(To be continued)

QUESTIONS IN TELEPHONY.

What is the difference between a direct and an alternating current as used in telephony?

For what part of the telephone apparatus does the direct current supply energy?

Radio Telegraphy.

RHEOSTAT AND REACTANCE CONTROL.

In order to control the power delivered to the transformer a variable resistance or rheostat is sometimes inserted in series in the circuit of the alternator armature and transformer primary; in other cases a variable inductance called a reactance or reactance-regulator is used, consisting of coils of heavy wire, with taps brought out at different points, wound on a laminated iron core. The rheostat and the reactance may serve similar but not necessarily the same purpose; thus increasing the resistance in the rheostat always decreases the power delivered to the transformer, and increasing the reactance may do likewise. In these cases the rheostat or reactance may normally be cut out of circuit and introduced only as needed to cut down the power, as, for example, when it is desired to decrease the range of a set so as not to cause interference at a distant station or when, as required by law, a ship station reduces its power as it comes within fifteen miles of a naval or military station.

Increasing the reactance does not always cut down the power; in fact, in some circuits of the quenched-spark type it may actually increase the power delivered to the transformer, and hence to the antenna, where it causes an increase in the antenna current. The reason for this is that there is a combined adjustment of the inductances in the transformer primary and secondary circuits and of the capacity of the closed circuit condenser which is best adapted for the charging of this condenser at regular intervals. In some cases more inductance is required than that in the alternator armature, and the transformer primary, and it is then added as a reactance in the primary circuit. In other cases the inductance may be added as a reactance in the secondary circuit, where evidently the coil must be designed to withstand high potentials. In a few cases reactances are added in both circuits so as to secure the desired results. When the best adjustments have been attained it is often found that the transformer primary current drops to a minimum value, the antenna current rises to a maximum and at the same time the note of the spark is the clearest. *(To be continued)*

QUESTIONS IN RADIO TELEGRAPHY.

Why is a variable resistance, or a rheostat as it is usually called, inserted in the alternator armature and transformer primary?

Shop Talk.

BY THE OBSERVER.

In reading various trade journals I have often seen it stated that many of the readers have asked the editor to recommend some book, or books, whereby one could secure a better insight into his profession, etc. The same question has been asked me many times and I have always answered it to the best of my ability. My first reply has always been "subscribe for the best trade journal devoted to the particular line of business in which you desire to get better posted." After that I have suggested certain text books.

No doubt many of your readers have asked the same question. To all I would say, subscribe for TELEGRAPH AND TELEPHONE AGE and read it carefully.

Only a short time ago I heard a man say of his trade journal: "It is not as good as it formerly was." Now I happen to be a subscriber and I inquired: "why is'n't it?" He said: "Oh, I have not read it for several months; I became tired of it." During the time he became tired of it I read much that was valuable and clipped several choice pages placing them in a loose leaf binder, the same constituting an excellent reference library when properly maintained. I have choice pages from various trade journals in loose leaf binders, that I have been gathering during my entire telegraph life, and I have more good information than any one text book contains. There is no patent on this, merely a little labor that will produce results. The telegraph company is supplying specifications written to the point by experts; it has established courses with a correspondence school and the present generation's chances for an electrical education is far better than that of a few years ago when the only source of information was text books at so much per, and our Alma Mater—The AGE. But, the trade journal presents ideas from the man in the field and tells what is going on in the particular world, more of which you are desirous of knowing. Therefore I would say, subscribe for TELEGRAPH AND TELEPHONE AGE; take the correspondence school course that treats of your particular field; secure all the specifications you can, preserve them as they are issued, and after you finish your course these specifications will act as a post graduate course, and will be easily understood and applied. Do not try to do too much at one time, especially in study. It is not how much you read, but how much you understand. It is not necessary to memorize everything, but it is necessary to know where to lay your hand on certain formulas, etc., when the demand for the information exists. My reason for laying stress upon taking the correspondence school course is because the methods are systematic and will give you a firm foundation to build upon. If you pass the examinations then "you know that you know." There may be many whose general education is such that they do not need the training outlined in the courses and who desire some good books on telegraph engineering. To such I would say, subscribe for and read carefully TELEGRAPH AND TELEPHONE AGE. Get a Jones book for your pocket and daily helper. For your library there are none better than Maver's "American Telegraphy" and McNichol's "American Telegraph Practice." For a book on electrical testing there is much in favor of Schneider and Hargraves. An excellent little book for a beginner is "The A B C of Electricity," by W. H. Meadowcroft.

(To be continued)

Waves and Wave Motion.

Analysis of wave motion is always an interesting subject for the mind's attention, but to describe the action in words so plain that the simplest mind can "see through the whole thing," is not so easy as may be imagined. Prof. J. A. Fleming, the well-known English scientist, and the inventor of the famous Fleming valve, which is used in wireless telegraphy, has succeeded in doing this so well that we reproduce a portion of an article by him on this subject.

If we look at two floating objects not too close together we shall see that they perform a small oscillatory, up and down motion, successively and not simultaneously. A little careful scrutiny will thus convince us that the true motion of each part of the water is merely a small motion in a circle, being moved up, forward, downwards, and backward, and that each part performs this cycle of operations in its turn, and over and over again. The speed with which this cyclical motion is handed on from point to point is called the velocity of the wave. We might, for instance, imagine a seagull to fly along always keeping himself above one particular hummock of water. His speed would then be the speed of the wave. The distance from one hump to the next one, measured crossways or at right angles to the line of the crest, is called the wave length. The waves are said to be long when the distance is great from crest to crest, not when the ridges themselves are long.

Such waves on water are called surface waves; and the effect of them extends a very little way down into the sea. The same class of surface wave is produced when we throw a stone into still water in a pond or lake and notice the expanding rings of ripples which are thereby produced. This latter is a typical case of wave motion in two dimensions.

Again, if we give a jerk to the end of a long stretched cord a hump or kink travels along it, which is likewise a wave motion. Each part of the cord is lifted up and then let down successively, and the motion is handed on from point to point with a certain speed.

A large number of models of various kinds have been constructed to illustrate various forms of wave propagation. In the case of the water surface waves or the wave motion of a kink along a rope the displacement of each part of the medium, whether water or rope, is at right angles to the direction in which the wave is moving. On the other hand, we have forms of wave motion in which the displacement is in the direction of that motion. Thus, for instance, if a brass or steel wire is coiled into a spiral and the spiral suspended by threads attached to it at regular intervals, so as to support it in a horizontal direction we have a medium in which we can propagate what are called longitudinal waves. If we give to one end of the spiral a smart blow with a piece of wood, striking the spiral end-on and not sideways, we shall thereby suddenly compress the end, and the turns of the spiral at that end will be squeezed closer together, but they immediately expand again, and therefor compress the next or adjacent turns. The result is that a wave of compression runs through the spiral. We see each part of the spiral in turn slightly compressed and then relaxed.

Repeaters.

About the first thing a telegraph student attempts when he begins to make progress in his studies is to invent a repeater. Usually he thinks that his repeater is the best one invented and that his fortune is in sight. He is obsessed with the repeater idea, not knowing, perhaps, that repeaters are as old as the telegraph itself, and that the ground is literally covered with them.

Repeaters were described in the very early days of telegraphy. Davy, in 1838, illustrated a "renewer" and Morse used a one-way repeater. These were necessitated largely by the poor character of the line insulation. Usually the insertion of a repeater of the type prevailing about 1871 resulted in a reduction in speed of the whole circuit. Sir John Gavey of England greatly improved such repeaters by the introduction of direct repeating from the relays, and in this country many excellent repeaters were invented and put into practical use, among them being the Toye, the Hicks, the Milliken, the Ghegan, the Weiny-Phillips, the Atkinson, and others equally well-known. Early relays actuated electromagnetic keys and the inertia of these slowed down the rate of working so that a repeater was only introduced when bad weather conditions prevailed. As a result of Gavey's improvement, the introduction of a repeater actually increased the speed of a circuit, by reducing the effective KR to that of the longest section.

Care of Storage Batteries.

A prominent example of the effects of unequal expansion and contraction of matter is found in the storage battery. Man has not yet been able to counteract these effects, and probably never will, and the best he can do is to use mechanical means to keep things balanced.

One of the most serious difficulties experienced with a storage cell is "buckling" or bending of the plates under the pressure set up in the active material by the chemical reactions. While aggravated by an excessive charge or discharge this takes place to some extent under the most favorable conditions and eventually short circuits the cell. The soft lead plate is especially prone to this trouble and often has to be actually blocked in place by plates of glass or other insulation. Aside from the pasting feature, the hard lead plate represents an attempt to overcome this difficulty by using a grid stiff enough to hold its shape; an attempt which has been only partially successful, because while a hard lead plate buckles much slower than a soft one, it is harder to straighten and more apt to be broken in the process.

While less subject to buckling, the hard lead plates are more liable to disintegration of the active material, not only lessening the capacity of the cell but occasionally short circuiting it by pieces lodging between the plates. Disintegration is also a source of danger in forming sediment at the bottom of the jar, short circuiting the cell when it reaches the plates.

The Serial Building Loan and Savings Institution.

A meeting of the Board of Management of the Serial Building Loan and Savings Institution, New York, was held at the Hotel Breslin, New York, on the evening of June 21, for the purpose of discussing the welfare of the association in an informal way, and to meet personally Mr. Thomas W. Carroll, the new president of the Institution.

At the conclusion of the dinner Mr. T. M. Brennan, treasurer, was asked to act as toastmaster.

President Carroll delivered a very optimistic address and stated that under his presidency he hoped the Institution would continue to accomplish as much good work in the behalf of the fraternity in the future as it had in the past.

Secretary Edwin F. Howell gave some statistics to show what had been accomplished by the Institution since its organization, some thirty-five years ago. Telegraphers had invested $5,000,000 during that time in homes and they had on deposit the sum of $1,227,000, yielding an annual income of 5 per cent. interest. Telegraph and telephone employes were encouraged to own their homes which they can arrange to purchase through the Serial on payment of a sum equal to rent. Hundreds of New York telegraphers have become property owners and large depositors through the operation of this admirable institution.

Among the other speakers were Thomas E. Fleming, John T. Mulhall, John A. Hill, M. J. O'Leary and J. B. Taltavall.

Those present were: T. W. Carroll, T. M. Brennan, E. F. Howell, T. E. Fleming, M. J. O'Leary, W. J. Quinn, P. J. Casey, E. P. Tully, J. F. McGuire, C. G. Ross, C. A. Kilfoyle, C. Jacobson, C. P. Bruch, J. R. Beard, J. A. Hill, M. W. Rayens, J. B. Taltavall, J. J. Ghegan, J. T. Mulhall, M. J. Kenna and C. E. Rafford.

Improved Repeater.

Mr. L. C. McIntosh, of the Southern Pacific Company, Los Angeles, Cal., is the co-inventor with Mr. C. L. Lewis, superintendent of the Postal Telegraph-Cable Company at the same point, of a telegraph repeater which has some interesting features, especially that of working through foggy atmosphere, which abounds along the Pacific Coast. The repeater is designed to work into a side line.

In the opinion of Mr. McIntosh, much of the trouble with repeaters is due to "kicking" and "lagging," as a result of mechanical inertia. The heavy levers on the transmitters and sounders must be moved and the power required to set them in action reduces the electrical sensitiveness that much.

One of these repeaters was used for one year at Los Angeles on the Santa Barbara-San Diego wire of the Postal Telegraph-Cable Company and worked with satisfaction, when other repeaters failed.

The original instrument has been improved and the new form makes it applicable to repeating in three directions. It is a direct-point repeater, the holding magnet and line magnet being combined in one, the holding magnet taking hold the instant the line magnet lets ago. There is practically no mechanical inertia or lag of heavy armatures to contend with. The main line coils are wound to 150 ohms resistance and the local coils to ten ohms for dynamo; forty volts or four ohms for gravity battery. The repeater, Mr. McIntosh states, has received the approval of some telegraph engineers, who pronounce it a good device.

Camp Telephones for the Army.

It is doubtful if a modern war could be conducted without the telegraph and the telephone, the latter particularly, and the development of this class of apparatus for army use has well nigh reached perfection.

The allies have attained a high degree of mobility and reliability in their military telephone service, and the United States is not behind in its development work.

The camp telephone, which supersedes the field telephone was developed by the Signal Corps for use in connection with camp telephone systems and small arms target range systems, and may be installed in tents and structures, or considered a portable instrument for use in the field for testing lines or other purposes.

Another class of apparatus which will play an important part in military operations is the service buzzer. This is strictly a portable instrument and is issued to troops in the field for use in connection with all kinds of lines of communication. It may be used as a telephone or for sending customary Morse or Continental code signals and for that reason it is specially adapted for field use.

When it becomes impracticable to transmit messages telephonically, due to line becoming impaired or for other reasons, the usual telegraphic signals can be transmitted and are received in distant telephone receivers in the form of a high-pitched hum, somewhat similar to radiotelegraphic signals. These signals have been exchanged between two of these instruments after the line wire had been severed, both the ends, however, being slightly grounded.

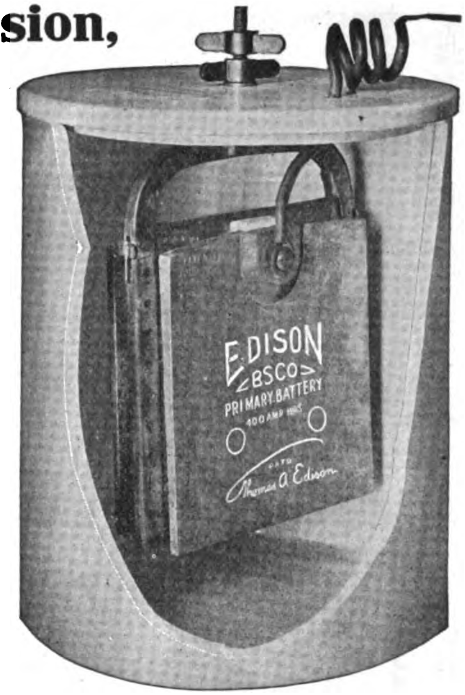
The service buzzer, which is the latest approved instrument of this type of apparatus, replaces the field buzzer, the cavalry buzzer, and the field artillery telephone.

NEW YORK ELECTRICAL SOCIETY ELECTION.—Officers of the New York Electrical Society were elected June 14 as follows: President, Dr. A. S. McAllister; vice-presidents, J. F. Carey, W. Neumuller, G. H. Barbour; secretary, G. H. Guy; treasurer, T. F. Honahan.

A MONUMENT TO PROF. MORSE, the inventor of the telegraph, is to be erected at Buenos Aires, Argentine, in the near future. A sculptor is now engaged on the work.

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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DAYS KERITE

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO

THE RAILROAD.

John J. Keenan, aged fifty-four years, an attorney of Toledo, Ohio, and a brother of Mr. E. C. Keenan, general superintendent of telegraph, New York Central Lines, New York, and son of the late Joseph Keenan, of the Western Union Telegraph Company, Toledo, died June 16. Mr. Keenan was a telegraph man and was at one time chief clerk to Wm. Kline, superintendent of telegraph of the Lake Shore and Michigan Southern Railway Company.

William T. Boyd, aged sixty years, a well known railroad telegrapher, and for the past twenty-five years division operator of the New York Division of the Erie Railroad, died at his home in Harriman, N. Y., June 19.

Western Division Proceedings.—The report of the proceedings of the meeting of the Western Division of the Association of Railway Telegraph Superintendents, held in Chicago, April 19, have just been issued. The pamphlet contains 92 pages, and is neatly gotten up. Mr. H. D. Teed, superintendent of telegraph of the Frisco Lines, Springfield, Mo., is chairman of the division.

L. F. Saylor, Supervisor, Commercial Telegraph Service Rock Island Lines, Chicago.

A brief announcement was made in our June 16 issue of the appointment of Mr. L. F. Saylor as supervisor of commercial telegraph service for the Rock Island Lines, with headquarters in Chicago. Mr. Saylor first entered the telegraph service at Port Huron, Mich., in September, 1906. In May, 1907, he was employed as operator for the Western Union Telegraph Company, at Detroit, and in July, 1910, was transferred to the office of Mr. H. J. Kinnucan, district commercial superintendent, as clerk. In July, 1912, he was transferred from Detroit to the office of Mr. T. W. Carroll, division traffic superintendent, Chicago, and acted as traffic supervisor until July, 1914. Mr. Saylor then entered the service of the Morkrum Company as installer and remained with it until July, 1915, when he returned to the Western Union service as traffic supervisor at Seattle, Wash., which position he held, when he received his latest appointment in April this year.

L. F. SAYLOR.

Mr. Ashton G. Saylor, former general manager of the Eastern Division of the Western Union Telegraph Company, now retired, and his brother, Elgin B. Saylor, of the Western Union, in New York, are uncles of Mr. L. F. Saylor.

Block Signals on New York Subways.

The great importance of the block signal system is exemplified on the New York Subway system, which has a greater density of traffic than any railroad line in the country and perhaps in the world. More than two thousand trains start each day from the terminals and between 1,000,000 and 1,500,000 persons each day ride over the lines. This is more than twice the number carried daily by all of the trains on the entire Pennsylvania Railroad system. Express trains are timed to run only one minute and forty-eight seconds apart.

Safety on the subway depends, most of all, on the man who operates the trains. Proof of the alertness and intelligence of the employes is found in the fact that 2,915,200,205 passengers have been carried safely in the last ten years, only one being killed in a train accident in that time.

Behind the efficiency of the employes are the numerous automatic signals and stopping devices. Block signals, placed from sixty-six to seven hundred feet apart, guarding every part of the express tracks, means use of the line to full capacity and an express train running from one block into another already occupied has its power automatically shut off and the brakes set in emergency application.

Recruiting Station for Signal Corps Reserves.

The United States Signal Corps enlisted reserves has established a recruiting station in the Putnam Building, Times Square, New York, in charge of Major Henry G. Opdycke. This station has jurisdiction particularly in New York City but also in the Eastern Division under Col. Hartman in the district east of Pittsburgh, Baltimore and Buffalo. Three distribution stations and a recruiting tent have been erected in Times Square, where signaling with heliograph and acetylene gas lamps are made nightly. Recruiting has been rather brisk since the opening of the station. Several thousand telegraphers, however, are desired for service and the training camp at Monmouth Park, N. J., is now in full operation. Men and officers are being sent there for a period of extensive training.

Mr. F. M. McClintic, the well-known telegrapher, who has passed his examination and has been recommended for a first lieutenancy, is in charge of recruiting in the Wall Street district.

Expert telegraphers who enlist in advance of the draft may expect to be enrolled as non-commissioned officers, which will entitle them to a better rating as to pay and other emoluments than they would receive if they wait for the draft.

Telegraph people who desire further information can obtain it by applying to Major Opdycke of the Putnam Building Recruiting station.

Origin of the Western Union Telegraph Company.

At the last reunion of the Old Time Telegraphers and Historical Association an historical and interesting document was presented by Mr. Frank A. Stumm of Arcola, N. J. It was a copy of the laws of New York State under which the New York and Mississippi Valley Printing Telegraph Company was incorporated, also of the articles of incorporation.

The evolution of causes that led to the organization of the Western Union Telegraph Company, constitutes an interesting and curious study in the history of the telegraph. Prior to 1850 the erection of telegraph lines had been spasmodic and fragmentary, without much, if any, continuity of purpose. Numerous companies, none financially strong, had been organized East and West, each jealous of, and frequently antagonistic to, others, until by 1851 over fifty different companies were in operation in different parts of the country. The manifest absurdity, considered from every point of view, of continuing such independent organizations under the adverse conditions then existing, early became apparent, and as a natural consequence local consolidations began to be effected. Finally, the larger merger in April, 1856, of the lines of the New York and Mississippi Valley Printing Telegraph Company (organized at Rochester, N. Y., in 1851, the virtual origin of the Western Union Company itself), with many of those of the West to which the prophetic name of Western Union Telegraph Company was given, firmly established the concern which the succeeding years have extended into greatness. For the ten years succeeding this important event the main office of the company continued to be located at Rochester, N. Y.

Following are the laws of the State of New York by and under which the Western Union Telegraph Company is incorporated and organized, together with the articles of association and incorporation of the New York and Mississippi Valley Printing Telegraph Company, which company was really the corner-stone upon which the Western Union Company was erected.

CHAP. 265.

An Act to provide for the Incorporation and Regulation of Telegraph Companies.

Passed April 12, 1848.

The People of the State of New York, represented in Senate and Assembly do enact as follows:

Section 1. Any number of persons may associate for the purpose of constructing a line of wires of telegraph through this State, or from and to any point within this State, upon such terms and conditions, and subject to the liabilities prescribed in this Act.

§ 2. Such persons, under their hands and seal,* shall make a certificate which shall specify:

1st. The name assumed to distinguish such association, and to be used in its dealings, and by which it may sue and be sued.

2d. The general route of the line of telegraph, designating the points to be connected.

3d. The capital stock of such association, and the number of shares into which the stock shall be divided.

4th. The names and places of residence of the shareholders, and the number of shares held by each of them respectively.

5th. The period at which such association shall commence and terminate, which certificate shall be proved or acknowledged, and recorded in the office of the Clerk of the County, where any office of such association shall be established, and a copy thereof filed in the office of the Secretary of State. Such acknowledgment may be taken by any officer authorized to take the acknowledgment of deeds of real estate, at the place where such acknowledgment is taken.

§ 3. Upon complying with the provision of the last preceding section, such association shall be, and hereby is declared to be, a body corporate, by the name so as aforesaid to be designated in said certificate; and a copy of said certificate, duly certified by the clerk of the county where the same is filed and recorded, or by the Secretary of State, may be used as evidence in all courts and places, for and against any such association.

§ 4. Such association shall have power to purchase, receive and hold, and convey such real estate, and such only as may be necessary for the convenient transaction of the business, and for effectually carrying on the operations of such association, and may appoint such directors, officers and agents, and make such prudential rules, regulations and by-laws, as may be necessary in the transaction of their business, not inconsistent with the laws of this State or of the United States.

§ 5. Such association is authorized to construct lines of telegraph along and upon any of the public roads and highways, or across any of the waters within the limits of this State, by the erection of the necessary fixtures, including posts, piers or abutments, for sustaining the cords or wires of such lines; provided the same shall not be so constructed as to incommode the public use of said roads or highways, or injuriously interrupt the navigation of said waters; nor shall this Act be so construed as to authorize the construction of any bridge across any of the waters of this State.

§ 6. If any person over whose lands said lines shall pass, upon which said posts, piers or abutments shall be placed, shall consider himself aggrieved or damaged thereby, it shall be the duty of the county court of the county within which said lands are, on the application of such persons, and on notice to said association (to be served on the President or any Director), to appoint five discreet and disinterested persons as commissioners, who shall severally take an oath before any person authorized to administer oaths, faithfully and impartially to perform the duties required of them by this act. And it shall be the duty of said commissioners, or a majority of them, to make a just and equitable appraisal of all the loss or damage sustained by said applicant, by reason of said lines, posts, piers or abutments; duplicates of which said appraisement shall be reduced to writing, and signed by said commissioners, or a majority of them; one copy shall be delivered to the applicant, and the other to the president, or any director or officer of said association or corporation, on demand; and in case any damage shall be adjudged to said applicant, the association or corporation shall pay the amount thereof, with costs of said appraisal, said costs to be liquidated and ascertained in said award, and said commissioners shall receive for their services two dollars for each day they are actually employed in making said appraisement.

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* So in original.

§ 7. Any person who shall unlawfully and intentionally injure, molest or destroy any of said lines, posts, piers or abutments, or the materials or property belonging thereto, shall, on conviction thereof, be deemed guilty of a misdemeanor, and be punished by a fine not exceeding five hundred dollars, or imprisonment in the county jail not exceeding one year, or both, at the discretion of the court before which the conviction shall be had.

§ 8. It shall be lawful for any association of persons organized under this Act, by their articles of association, to provide for an increase of their capital, and of the number of the association.

§ 9. Any association or company now organized and using Morse's telegraph may organize a corporation under this Act on filing in the office of the Secretary of State a resolution of its board of directors, signed and certified by the officers of the company, of its desire so to organize, and upon publishing notices to this effect in some one newspaper in the city of New York, and the city of Buffalo, and the city of Albany, three months previous to such organization, provided that two-fifths of the owner* of the stock of said company or association do not dissent therefrom; provided that any stock or shareholder in any such association or company may, on giving thirty days notice to the officers, or any of them, of such association or company, at any time before such organization, refuse to go into such organization, and thereupon such stock or shareholders shall be entitled to receive from such association or company, the full value of his shares or stock in such association or company.

§ 10. The stockholders of every association organized in pursuance of this Act shall be jointly and severally personally liable for the payment of all debts and demands against such association which shall be contracted or which shall be or shall become due during the time of their holding such stock; but such liability of any stockholder shall not exceed twenty-five per cent. in amount, the amount of stock held by him, and no stockholder shall be proceeded against for the collection of any debt or demand against such association, until judgment thereon shall have been obtained against the association, and an execution on such judgment shall have been returned unsatisfied in whole or in part, or unless such association shall be dissolved.

§ 11. It shall be the duty of the owner or the association owning any telegraph line, doing business within this State, to receive dispatches from and for other telegraph lines and associations, and from and for any individual, and on payment of their usual charges for individuals for transmitting dispatches, as established by the rules and regulations of such telegraph line, to transmit the same with impartiality and good faith, under the penalty of one hundred dollars for every neglect or refusal so to do, to be recovered with costs of suit, in the name and for the benefit of the person or persons sending or desiring to send such dispatch.

§ 12. It shall likewise be the duty of every such owner or association to transmit all dispatches in the order in which they are received, under the like penalty of one hundred dollars, to be recovered with costs of suit, by the person or persons whose dispatch is postponed out of its order, as herein prescribed; provided, however, that arrangements may be made with the proprietors or publishers of newspapers, for the transmission for the purpose of publication of intelligence of general and public interest, out of its regular order.

§ 13. This act shall take effect immediately.

(To be continued)

An Interesting Bit of War Telegraph History.

BY G. C. MAYNARD.

SMITHSONIAN INSTITUTE, WASHINGTON, D. C.

Colonel Joseph M. Locke, of Washington, D. C., a retired officer of the United States Army, now eighty-four years old, is a son of John Locke, who was quite an eminent chemist, mathematician, astronomer, inventor of an electric chronograph, once a professor in the Cincinnati College, a personal friend of Humboldt, etc.

Colonel Locke was a young boy when the successful operation of the Morse telegraph was announced and became much interested in the subject. He learned the Morse alphabet and made sound signals with a musical instrument which were read by persons in some neighboring building who also knew the alphabet. Colonel Locke spent some time in Germany and received a degree from one of its universities. He served actively through the Civil War. On one occasion he was with the Union Army in the Shenandoah Valley, when the Confederate troops marched up the valley with the Union forces on the hills on both sides of the route. One day it was of great importance that the news of the advance of the Confederates should be communicated from Locke's side of the valley to the forces opposite. They could not use the flag signal, which might be seen and translated by the Confederate forces. Locke removed the lens and eye-piece from the telescope, split open a tin canteen which he used as a reflector which threw the light through the telescope and using his hat to cut off the light, signaled with the Morse alphabet. His signals were seen and read by the forces across the valley.

Colonel Locke does not assume to have been a telegraph operator and the instances mentioned are the only ones in which he really did any telegraphing, but he is much interested in the general subject of electrical transmission. He is an active, very interesting man with large experience.

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*Passed April 8, 1851.

MR. JEFF W. HAYES' DEPARTMENT.

Stick to Your Post.

Soap Creek was not an inspiring spot for a boy reared tenderly to make his debut in the telegraph arena, and Clint Greenwell gazed ruefully around him at the surroundings when the accommodation train dropped him in front of a dilapidated shack which would serve as a stepping-stone to his fame and fortune.

There were no houses visible from this spot, but it had been told the young operator that across the hill a mile or two there was a settlement where he could find board and lodging.

The operator's duties were entirely devoted to the Standard Oil Company and consisted in reporting to the head office, at Oil City, the conditions of the pipe line, made up from the reports of the pipe line tester who made constant trips between Soap Creek, mallet in hand, testing each twenty feet of pipe laid along the route.

The office was a rough board shack, a deal table to hold the Morse instruments and a couple of home-made stools.

Adjacent to the office was a large reservoir capable of holding several thousand barrels of oil. It was used as a receptacle for the oil in case of a break in the pipe line and it was the chief and only duty of the operator at Soap Creek to manipulate the lever and turn the oil into the reservoir should any leakage or break occur in the pipe.

Young Greenwell's duties were, therefore, important, but in no way irksome, it being particularly essential that he attend strictly to business and be constantly on hand during working hours for any emergency that might arise.

"The poipe loin is O. K.," sang out Michael Costello the next morning as he put his homely face in the window of the little office.

"Glad to hear it," replied young Greenwell, "come in and get acquainted."

Costello complimented the boy for his good fortune and luck in being able to fill such an important position at the age of fourteen, and predicted great things in store for him.

So profuse were the laudations that Greenwell began to believe he had fallen into a snap and his job was merely a precursor of a life-long sinecure.

"Tend to your business, me bye," declared Costello, "and yees will arise to the top of the ladder some day."

The operator's hours were from 7 a. m. till 6 p. m., and the only person he saw all day was Costello.

There was little business going on over the wire and the legend, "Pipe line O. K.—Costello, S. P.," three times a day were all the duties, so far, called for from the young operator.

Six weeks of this desultory life had passed; every message passing over the wire had been copied for practice by Greenwell each day, and he was vainly looking for that recognition of his service by the company, so earnestly advocated by Michael Costello.

"There's to be a grand game of baseball today over there in Oil City and ivery mothers' spalpeen is going," remarked Costello one day.

At the mention made of baseball the blood in Greenwell's veins began to grow warmer and the more he pondered on the subject the more he determined to see it.

"Why, I have been here for six weeks and have virtually done nothing but report the pipe line O. K. three times a day. I don't see much immediate chance for me to rise to that great position prophesied by Costello. I don't think that I would be taking any chances in running over this afternoon to see the ball game and I believe that I will try it. No one will know the difference."

Thus debated young Greenwell, as he hesitated between pleasure and duty.

"Ki, yi," screamed a couple of boys driving a butcher wagon just over the hill. "I say, young fellow, you had better come with us and see the ball game—it is the best game of the season," was the remark the tempters made, and which decided Greenwell.

With a bound he was in the wagon, off to the ball game!

"We can take you there but you will have to hoof it back, as we live south from here," remarked the occupants, but the anticipation of a four or five-mile walk merely added zest to the afternoon's outing.

The game, like everything else, came to an end; it was interesting and American, and Greenwell did not regret the homeward journey on foot if he was but satisfied that everything had gone well with the pipe line.

Swinging his shinnie aloft in the air, he ran, walked and dog-trotted till he came to the hill overlooking the little valley where his office was located.

"What is that black stuff I see so much of? It is all in and around the office and I do believe the pipe line has burst!"

Looking up the road, Greenwell discerned a figure approaching on horseback, riding at top-notch speed.

The rider and Greenwell arrived at the office simultaneously.

"Are you the operator here?" queried the stranger.

"I am," replied Greenwell.

You hain't, neither," ejaculated the horseman: "you mean you were the operator, but you hain't the operator no more," and the stranger smiled ironically.

"Dontcherknow what John D. will do to you?" he continued. "Why, you have lost 50,000 barrels of crude oil and John D. will make you work the rest of your life, for nothing, to pay for this."

An oil train with a caboose attached to the rear hove in sight. A whispered colloquy took place between operator and conductor, and a minute later Greenwell boarded the oil train for his Cleveland home.

His mother welcomed him home, quieting all his misgivings, but urging him to gather a lesson from the incident which would be of lasting value.

Clint Greenwell never called for his pay at the office of the Standard Oil Company, and he often related that the experience was salutary and lasting.

The Pleiades Club.

CHAPTER XVI.

Much activity was being displayed by the New York members of the Pleiades Club on the fields surrounding the Telegraphers' Tabernacle, and the air reverberated with the sound of the hammer.

This activity was being manifest in the construction of old-fashioned balloons, shambling dirigibles and the more graceful aeroplane.

Of course it was really not necessary for the spirits on the planet Mars to have any such slow means of locomotion but the idea seemed to keep busy and active and be entertaining to their friends.

The air craft was unique in appearance and novel in design, and would have been considered marvelous on Mother Earth.

Many hundreds of ex-New York telegraphers were on the plaza, engaged in more serious conversation than was generally their wont. The interest centered on the war and the devastation being created by the U-boats.

"I have the greatest confidence and hope in the ability of Tom Edison to cope successfully with this menace," said Biff Cook, "just as he has mastered many another difficult problem. I have no doubt that even now his keen brain has invented a device to offset the machinations of the submarine. I don't like to see our American boys engaged in this strife and hope that Uncle Sam's entrance into the arena will have the moral effect of bringing on the hoped for peace," and "Biff" sat down after prolonged applause.

The New York aeroplane club invited their friends for a whirl through space, their object being to try and meet the "Thunderbolt express" which was expected hourly bearing George W. Conkling.

Some hundred miles down the line, the "Thunderbolt express" was stopped and Mr. Conkling stepped aboard the dirigible "Gotham" (Tom Ragen, commander), where he was saluted by whistles laden with "73," etc.

Mr. Conkling was pleased with his reception and the evening was spent in listening to the latest news from Mother Earth as delivered by America's fastest telegrapher.

There is going to be a meeting of the Magnetic Club tonight in the Telegraphers' Tabernacle and you are all invited to come and have a good time.

The speaker was John W. Mackay, and as his voice rang out in hospitable notes, a tumult of applause broke out on every side, which assured a full house.

The irrepressible John W. Kelly promised to be on hand to entertain the gathering as "only Kelly can."

Former telegraph presidents, general superintendents, superintendents, construction superintendents, linemen, managers, operators, chiefs and wiremen all promised to take part in the banquet which was destined to be a never-forgotten affair.

Music was the feature of the banquet and all the patriotic pieces were played and encored to the echo.

J. W. Kelly was more than usually at home and his songs and jokes kept the audience in a roar.

Addresses were made by the following gentlemen: Belvidere Brooks, Alfred S. Brown, "Biff" Cook, Charlie Parr, Tom Dolan, A. E. Sink, Jimmy Hennessey, Ed. Delaney and others.

"We have had such a nice time this evening and we have all been very much entertained," said Belvidere Brooks, "and as none of us are tired, supposing we take an air flight in our machines by way of recreation, and when we return the members of the Morse Club will be very glad to have you tarry at our big round table and partake of the Club's hospitality."

Events were occurring rather fast, but there was nobody disinclined to have all the enjoyment there was in sight, and after a joyful aerial ride, the Morse Club rooms began filling up.

A diversion of programme was made and many ladies, known to the profession, were present.

The speakers were: Alfred S. Downer and his brother David, Gillie Olmstead, Henry A. Bogardus, Gib Merrill, George Fagan, Hank Cowan and others.

Those present besides those mentioned were: William Orton, Norvin Green, C. A. Tinker, E. D. L. Sweet, R. H. Rochester, D. Rich, Stephen D. Field and his uncle Cyrus W. Field, Moses G. Farmer, S. F. B. Morse, Alfred Vail, Ed. Leslie, Fred N. Bassett, P. V. DeGraw, Ham. Young, L. B. McCarthy, Dennis Doran, H. H. Ward, W. D. Schram, J. W. Morlan, W. L. Waugh, Thomas T. Eckert, Maurice Brick, D. B. Mitchell, Thomas P. Scully, J. A. Henneberry, E. E. Stewart, James McParlan, H. V. Shelley, M. H. Redding, Lant Jones, H. P. Dwight, J. C. Hinchman, William J. Holmes and many others well known on earth several years ago.

Chicago Western Union.

Miss Rae Folsom, private secretary to General Manager C. H. Gaunt, of the Western Division, has returned from a visit to Salt Lake and is again at her desk. Miss Folsom is a valuable adjunct to Mr. Gaunt's staff, due to her intelligence and business sagacity, coupled with the thorough training for the position which she occupies.

Herbert Brown, commercial superintendent of the Chicago district, is in receipt of a picture of the veterans of Company K, Oregon National Guard, which displays a photograph of Mr. Brown taken with the rest of his comrades. A picture of the editor of this department is also in the group. Mr. Brown was formerly sergeant of Company K at Portland, Ore.

Liberty Bond subscriptions from all departments in the Western Division amounted to approximately $450,000.

The sympathy of the entire force of the Chicago office is with C. Howard Shell, in the death of his father, who passed away in Pierce, Ill., last week, at an advanced age.

Lieutenant Chester Wright, once upon a time a member of this force and who has been lately connected with the U. S. Signal Corps at Fort Sheridan, has been transferred to Fort Leavenworth, Kan.

General Manager C. H. Gaunt will vacate his present quarters on the sixth floor, removing to the fifth floor, now partly occupied by the division traffic department. The entire sixth floor will be taken over by the operating room, which is expanding rapidly.

The office of Chief Operator Evan T. Jones has been moved to Room 409, the space vacated by Commercial Superintendent, John C. Nelson, who is now located in the Webster Building.

Hereafter, all employes of this office will be paid once a week, on Friday. To some, the innovation will be hailed with delight; to others it will be a matter of indifference, while to many it will be regarded as a nuisance, all of which goes to prove that it takes all kinds of people to make a world.

David S. Anderson, for many years manager of the Board of Trade office, and so well known to visitors at the Old Timers' gatherings, is working for a brokerage firm in Chicago.

Frank Richardson, formerly a well known member of this force, is night manager of an important branch office in Los Angeles, Cal.

Chicago Postal.

E. W. Collins, general superintendent, and superintendent C. A. Comstock, visited Detroit, Pontiac, Flint, Saginaw, Bay City, Lansing, Battle Creek, and Kalamazoo, during the fore part of June, the object being to note and improve conditions for the betterment of the service and the comfort of employes. These officials always have a word of encouragement and cheer, and for that reason they are welcomed everywhere. During the absence of Mr. Collins his daughter was taken to the hospital, where she was operated on for appendicitis, but she passed the ordeal safely and is now on the highway to recovery. Upon returning to Chicago, Mr. Comstock took his son to the hospital for a minor operation, and the young man is himself again.

Supt. J. F. Looney of Indianapolis felt it incumbent upon him to get in line, and on June 16 he went to a hospital for the removal of some intestinal obstruction, and his office reports him doing nicely. Mr. J. G. Blake, special agent, is looking after Mr. Looney's district temporarily.

Mr. J. J. Whalen, manager, New York office, recently visited Cleveland and Detroit, and is now in Chicago. Mr. Whalen always finds a welcome at the hands of the chief operators everywhere, because of the wholesomeness of his presence and the inspiration he imparts.

Mr. Edward Reynolds, vice-president and general manager, and Mr. W. I. Capen, were in Cincinnati on business recently, Mr. Reynolds returning direct to New York, and Mr. Capen going South on company business.

Mr. L. R. Thomas has returned from a ten days' trip in the sixth district.

Mr. Harry C. Shaw, division electrical engineer, Chicago, has been appointed Pacific Division electrical engineer, with headquarters at San Francisco, the former incumbent, Mr. V. V. Stevenson, having succeeded Mr. C. L. Lewis as superintendent at Los Angeles. Mr. W. L. Simpson will, no doubt, succeed Mr. Shaw as Division Electrical Engineer at Chicago. Mr. Shaw is a man of irreproachable character and high ideals, as is also his probable successor, Mr. Simpson.

Mr. T. N. Powers, manager operating department, Chicago, spent a week in Detroit recently, looking over traffic conditions at that office, and consulting with Chief Operator Macksey relative to the general service.

LETTERS FROM OUR AGENTS.

When anyone desires electrical or other educational books, Vibroplexes, or wishes to subscribe for TELEGRAPH AND TELEPHONE AGE, why delay when local agents of this publication can be found in almost every office in the country? Our agents are enterprising and will be glad to promptly attend to every order placed with them. If you do not know who the local agent is in your office, make inquiries and place your orders intended for this office through him. He will give them immediate attention.

New York Postal.

I. Feldman, of the main office, was married on June 10 to Miss Tillie Greenside, formerly of Sears, Roebuck Company.

R. M. Telschow, the well-known writer, identified with the main office force, will return to duty on July 2 after enjoying a well-earned vacation.

New York Western Union.

The traffic department alone subscribed for $114,200 worth of Liberty Loan Bonds. The division and other offices located in this building were also very liberal in their responses to the needs of the government in their subscriptions for bonds.

G. E. Palmer, chief operator, presented the mascots to the first two baseball teams at the theatre party given under the auspices of the Western Union Educational Society in the Lexington Theatre on June 14.

Hobart Mason, circuit layout and routing engineer in the office of the vice-president in charge of traffic, gave a talk on "Circuit Layouts" before the Western Union Educational Society on June 27.

Fred Bauer of the automatic department, who has been doing government service in Long Island City, was shot while on duty. It is thought that the shot was fired from an automobile. Mr. Bauer suffered a serious injury to the knee.

R. F. Drehner, division automatic supervisor was married on June 10 to Miss T. McElroy of the automatic department.

Among other marriages were P. J. Reilly of the Central Cable Office to Miss A. G. Carroll an automatic operator; W. A. Ingham of this office to Miss Minnie Metzler, statistical clerk, and B. Gesicki of the operating department to Miss May Duffy, an automatic operator.

Michael Kenney, aged forty-seven years, a porter in this office, died of heart trouble on June 10.

The Marine Department has been attached to the United States Naval Reserves and the members of the staff will soon be in uniform.

V. G. Wallace, at present working in this office as an operator, wears the King's medal for bravery under fire in restoring communication at the Battle of Vimy Ridge, France. He is a Canadian operator and is working in New York during his furlough.

J. T. Ewing, all night chief operator, is on vacation and is relieved by E. J. Liston.

Liberty Loan buttons are now worn by almost every employe in the office.

Those desiring to place orders for subscriptions or electrical and educational books can have their wishes promptly attended to by S. Heiman of the division traffic superintendent's office who is agent for TELEGRAPH AND TELEPHONE AGE, covering all departments in the 24 Walker Street building.

A large silk flag, 6 by 9 feet, has been placed on the wall in the 16 Broad Street Central Cable Office. Superintendent W. A. McAllister and the entire staff are proud of the emblem.

Eighteen thousand dollars worth of Liberty Loan Bonds were sold to the Central Cable Office force.

The father of John Morison, supervisor in charge of ways, aged eighty-nine years, died May 18.

Frank Mittag, a clerk at 195 Broadway for many years, and well and favorably known to the entire staff, died May 21.

Philadelphia Postal.

Philadelphia Postal employes are more than enthusiastic about "crops." Nearly every one in the main office has a "back yard farm," and the topic in general now-a-days is "How's your garden ?" It is surprising the number of "back yard farmers" we have.

Our burglar department has more than outgrown itself in our new quarters. In addition to enlarging the switchboard by several panels, it has eventually crowded out the messenger boys' tailoring department to the subway-basement to make room for an additional burglar alarm equipment that is being installed under the supervision of City Foreman W. M. Fitzgerald.

F. D. Burke, master carpenter; J. M. Eder, cable department, and A. G. Carpenter, office electrician, have moved their departments to 1617 Ranstead Street, occupying a three-story building for their departments, on account of the burglar-alarm department requiring their former location.

Joseph Truedell, of our burglar-alarm department, had the experience of capturing a notorious thief in the act of robbing a house in the fashionable section of Philadelphia, while answering an "alarm." This is one of his many captures.

Among recent visitors here were vice-president and general manager E. Reynolds, vice-president C. C. Adams, and manager J. J. Whalen, of New York.

Denver Western Union.

In the Morse department we have several new faces: Wm. N. Morris, former wire chief Denver & Rio Grande at Pueblo is now repeater attendant at Denver; J. D. McLachlan, repeater attendant, transferred to Denver from Ogden; operators M. C. Nelson, R. P. Creelman, W. R. Calaway, of Casper fame; B. N. Devin, transferred from Seattle, Wash; E. H. Arnold, H. R. Bird, transferred from Kansas City.

Miss Elizabeth Vanderhoof has been confined to her home for some time with a broken arm but she is well on the road to recovery. We are pleased to welcome R. P. Cowarden back to the plant department. Daniel W. Vaughn, repeater attendant has left the service and we understand has accepted a similar position with the telephone company. Geo. M. McGill, has been transferred to Albuquerque, N. Mex.

Miss Nora Lea was married recently and left the key for life on the ranch. Louis G. Kirchenblatt, one of our faithful file clerks has enlisted in the navy.

In the automatic department the new arrivals are: M. E. Loomis, from San Francisco, night trick traffic regulation; C. Q. Adams, from Great Falls, student traffic regulation and W. Bucker, multiplex student traffic regulation.

Miss L. Lindstrom is relieving Mr. Blackwood during his vacation, having charge of the traffic in the multiplex department.

In the telephone department, Mrs. Lulu Ryan has returned to the Morse department and Mr. Cox is doing the day shift alone. Miss Georgia Flint has been transferred to Colorado Springs and Miss Lola Hollister comes to Denver from the telephone department at Colorado Springs. Miss Gracia Jones was transferred to Colorado Springs but had to return to Denver on account of not being able to stand the altitude at the Springs. We have in the telephone department new students as follows: Margaret McEnroe, Madaline Barkley, Helen Zuber, Marie Tulford, Irene McWharter, Lillie Anderson, Gladys Craigie, Rhoda Slee.

The new additions to the multiplex school are: Gertrude Mason, Elizabeth Ljungvall, Helen Swan, Rita Kohn, Alvira Hyden, Evelyn McEnroe, and Dorothy Okerstrom.

In the Morse school the recent additions are: Miss Hazel Crowl, of Antonito, Col., and Miss Agnes Wheatley, of Canon City. Miss Blanche Wing has been given a position as manager at Golden, Col. Arvid E. Smith and H. H. Hamilton have also taken positions in the Denver Morse department.

Los Angeles Notes.

Jack Beaton, well known in commercial and railroad telegraph circles, for several years past operator in the general telegraph offices, Southern Pacific Company, Los Angeles, Cal., has joined the Signal Corps and is located at Angel Island.

St. Louis Western Union.

Nearly all the employes of this company in St. Louis purchased Liberty Bonds on the monthly payment plan offered by the company. The total amounted to $35,000 or more, of which $24,000 was from traffic employes. The $50 bond was in the greatest demand.

The Western Union Electrical Society gave its seventh annual river excursion on the steamer "Alton," Thursday evening June 21. The weather and river conditions were ideal, and the entertainment programme, consisting of songs and recitations, interspersed by dancing, was greatly enjoyed by the 400 or more members and their families and friends aboard the boat.

New Book on Storage Batteries.

"Storage Batteries Simplified" is the title of a recently published book, by Victor W. Page, which gives the operating principles and describes the care and industrial applications of storage batteries. It is a non-technical but authoritative treatise discussing the development of the modern storage batteries and outlining the basic operation of the leading types. It also describes the methods of construction, charging, maintenance and repair, and all practical applications of commercial batteries are shown and described. The book has been written with the co-operation of the leading American storage battery makers and is fully illustrated. Generally, it covers the discovery of storage batteries; how they differ in construction; storage battery defects; charging methods and uses. There are two folding inserts showing the application of storage batteries to submarine boats. The Edison Storage Battery comes in for a complete description of its construction and advantages. There are 208 pages and 89 illustrations.

The price of the book is $1.50 per copy. Copies may be obtained of TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York.

SENDING BY LUNG POWER.—It is announced that a new telegraph sending device has been brought out which operates by puffs of air from the lungs, to take the place of the ordinary telegraph key. Instead of manipulating a key the operator makes dots and dashes by vibrating the air with his voice in front of something similar to a telephone transmitter, which opens and closes the circuit. It looks to us as if a terrible upheaval would occur among dots and dashes if the "sender" should lose the proper key to his voice. The new device, however, should prove to be a blessing to weak-lunged operators. It will build them up physically and the telegraph fraternity will become models of physical development. Operators under the new order of things will become very "Chesty." It will be a grand and inspiring sight to watch operators in a large operating room puffing dots and dashes into their instruments, and no doubt the dilated cheeks will remind one of a brass band.

THE TELEGRAPH AND TELEPHONE LIFE INSURANCE ASSOCIATION has issued the proceedings of the fiftieth annual meeting, held in New York, March 14. Mr. M. J. O'Leary, secretary of the association, 195 Broadway, New York, will be glad to give anyone information concerning the advantages of membership therein.

Mr. J. Hamilton, Northern District Manager, Western Union Telegraph Cable System, Liverpool, England, in remitting to cover his subscription for another year writes: "I much enjoy reading the AGE which I look forward to receiving, finding it not only valuable for the technical information, but also for the up-to-date news furnished regarding the American telegraph world generally."

Telegraph and Radio Operators, Electricians and Linemen, wanted for Signal Corps, U. S. Army. Pay ranges, according to rank and service, home or foreign, from $15 to $90 a month, and in addition rations, quarters, clothing and medical attendance are furnished. Signal Corps offers unusual opportunities for foreign service and rapid promotion to young men of character, intelligence and ability, who have had electrical training, particularly as telegraph or radio operators. For detailed information write to Chief Signal Officer, U. S Army, Washington, D. C.

33d YEAR

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No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fit snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. Address orders to TELEGAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York.

Telegraph and Telephone Age

No. 14. NEW YORK, JULY 16, 1917. Thirty-fifth Year

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BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, JULY 16, 1917.

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Demand for Operators for Government Service.

The demand for operators, as a result of the requirements of the Government for the signal service, is beginning to loom up as a very large problem for the telegraph, railroad and other interests employing large numbers of operators. These concerns will have to supply the Government with the help it needs, and how to do it and conserve their own interests is a hard problem for them to solve. Operators cannot be made in a week, or a month, or a year, as many people seem to think. It takes long practice to become sufficiently proficient to be entrusted with important business, and how the problem is to be met is engaging the serious attention of the interests concerned. It is a trying situation indeed, but the companies will probably find a way out of it so the public business will not suffer materially.

Origin of the Western Union Telegraph Company.

All things have an origin, but few of us have any knowledge of the history of the most familiar things and institutions about us, yet the history of human achievements is one of the most fascinating studies one can take up.

Comparatively few of those who are employed by the telegraph companies can tell how the companies came into being, how they grew and how they became the great agencies of progress that they are today.

The article on the "Origin of the Western Union Telegraph Company," which we began publishing in our July 1 issue, and continue in the present issue, takes us back to the beginning of the telegraph as a commercial enterprise. There were no telegraph laws then because there was no need for them. In 1847 laws were passed in New York State for the organization and government of telegraph companies and in reading them over one is impressed with the thoroughness and completeness with which the work was done. Very few amendments have been made to the original act. The early lawmakers seem to have been possessed with a keen sense of the future of the telegraph because they provided so well in the laws they passed for its proper development.

It is both interesting and refreshing to look backward occasionally and study the development of the companies. In this way we can note the great progress they are making toward rendering perfect service.

The Wonders of Electricity.

When a person speaks into a telephone transmitter his words are not carried over the wire to the receiver and listener at the other end as many uninformed people suppose, and it is this fact that classes electricity as one of the most wonderful of natural agencies. It is something like sending a message by code. A coded message must first be written in plain English, then it must be coded and transmitted in this form, then, on receipt, it must be decoded, or deciphered, so it can be made intelligible again. So it is with a telephone communincation. The "words" transmitted over the wire to the receiver are not sounds at all, nor sound waves, or anything like sounds or words, but just simply a succession of electric waves, because nothing else can go over a wire electrically. These waves, or disturbances in the steadiness of the electric current, act upon the receiver in such a manner that the original voice waves that brought them into being are reproduced, and we hear what we call the voice, but it is not the voice at all.

This intermediary action of electricity is one of the most wonderful facts in electricity, and who dare say, or predict, what the further application of the idea may lead to eventually.

We have yet to discover a way to see by electricity, and there is no doubt whatever that this feat will be accomplished by the proper application of the laws of electricity and mechanism. The world is waiting for such an invention, but like all other new ideas, development is slow. When the result is accomplished and announced to the world many will say, "how simple; why didn't someone think of that before," but the man who wins the prize knows why it was not thought of before. He knows that right in front of him there are many wonderful things to be revealed, but men have not yet reached the stage where they can look into the future and see what it has in store. Byron said "the best of prophets of the future is the past."

Telegraph and Telephone Patents.

ISSUED JUNE 19.

1,230,117. Telephone Exchange. To H. F. Clausen, New York.

1,230,170. Telephony. To M. L. Johnson, Chicago, Ill.

1,230,410. Operator's Key. To W. Kaisling, Chicago, Ill.

1,230,421. Automatic Telephone Exchange System. To A. E. Lundell, New York.

1,230,553. Telephone Booth and the Method of Manufacturing the same. To A. Beran, Hirschwang, Austria.

1,230,564. Telephone Exchange System. To H. P. Clausen, New York.

1,230,565 and 1,230,566. Telephone Exchange System. To H. P. Clausen, New York.

1,230,578. Telephone Signaling System. To. E. E. Hinrichsen, New York.

1,230,582. Telephone Exchange System. To L. H. Johnson, New York.

1,230,639. Semi-Automatic Telephone System. To B. D. Willis, Chicago, Ill.

1,230,694. Two wire to Three Wire Telephone System. To E. D. Fales, Chicago, Ill.

1,230,807. Telegraph Sending and Recording Device. To L. C. Shearer, Latrobe, Pa.

ISSUED JUNE 26.

1,230,835. Telephone Exchange System. To G. Babcock, Chicago, Ill.

1,230,884. Telephonic Apparatus. To C. Forgues, Paris, France.

1,230,956. Microphone. To A. Vaugean, A. de Lavandeyra and W. Garthwaite, Paris, France.

1,230,996. Telephone System. To. E. E. Clement, Washington, D. C.

1,231,013. Automatic Telephone Exchange System. To C. L. Goodrum, New York.

1,231,024. Telephone Exchange System. To E. E. Hinrichsen, New York.

1,231,085 and 1,231,086. Telephone Exchange System. To A. B. Sperry, New York.

1,231,095. Telephone Transmitter. To Naho Tannaka, New York.

1,231,140. Telegraph System. To A. F. Dixon, Newark, N. J.

1,231,319. Automatic Telephone System. To C. S. Winston, Chicago, Ill.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on July 12:

American Tel. and Tel. Co.	121
Mackay Companies	82¼-83
Mackay Companies, pfd.	64¼-64½
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2⅞
Western Union	93½

PERSONAL.

Mr. Oscar T. Crosby, a well-known electrical engineer and author of electrical and other books, has been appointed assistant secretary of the treasury.

Mr. Gisli J. Olafson, manager of telegraphs and telephone, Reykjavik, Iceland, is on a visit to the United States and was in New York June 28. He called on many friends while in the city.

Mr. Ashton G. Saylor, formerly general manager of the Eastern Division, Western Union Telegraph Company, New York, who retired from active service last August, is spending the summer in Maine.

Mr. W. H. Baker, former secretary of the Western Union Telegraph Company, New York, who underwent a slight operation four weeks ago, is now entirely recovered. He will spend the month of August in the Adirondacks on vacation.

Mr. W. B. Vansize, patent attorney and electrical expert, of New York, has opened an office at 160 Broadway, and is associated with Mr. W. H. Baker in exploiting the Radio Talking Picture Corporation.

Mr. C. V. Barfield, a well known operator in the Associated Press office at San Francisco, Cal., and one of the prize winners at the telegraph tournament in San Francisco, in August, 1915, recently passed examinations in that city for admission to the bar.

Mr. J. A. Ritter, formerly sales engineer of the Hall Switch and Signal Company, New York, has been appointed assistant general manager of the company, with headquarters at the factory at Garwood, N. J. Mr. B. A. Hinman, for several years sales engineer in the signal department, has been made sales engineer for the signal and selector departments, vice Mr. Ritter, with headquarters at the company's offices at 50 Church Street, New York.

Mr. Frans J. Fransson, the head of the electrical laboratory, Svenska, A. B. Gas Accumulator Company, Stockholm, Sweden, is in New York studying electrical conditions in this country. Mr. Fransson expects to return to Sweden in October. He is particularly interested in wireless telegraphy.

Mr. and Mrs. Horace L. Hotchkiss, of Rye, N. Y., celebrated their golden wedding last month and were surrounded by their three children, ten grandchildren and two great-grandchildren. One of the blessings which was recognized by the family assembled was the fact that during their married life they have not been called upon to realize the sorrow of death in the family.

Mr. Hotchkiss with the late E. A. Calahan was the organizer and he was the secretary and treasurer of the Gold and Stock Telegraph Company in 1867. Mr. Hotchkiss was also one of the founders of the first American District Telegraph Company and christened it that name. This was in 1871. He is well and favorably known to the older members of the telegraphic fraternity.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Offices on Pennsylvania Railroad.—This company, as for the past fifteen years, will maintain its offices in the Pennsylvania terminal depots as heretofore and its wires will be kept on Pennsylvania Railroad pole lines as in the past. The company will keep its present offices in Pennsylvania Railroad stations at New York; Broad Street, Philadelphia; Harrisburg, Pittsburgh, Baltimore and Washington.

Mr. W. I. Capen, vice-president, left New York for the Pacific Coast on July 11 on a general trip of inspection. He will be absent about one month.

Mr. W. L. Simpson has been appointed division electrical engineer at Chicago, to succeed Mr. H. C. Shaw, who has been transferred to a like position at San Francisco, Cal. Mr. Simpson was Mr. Shaw's assistant in Chicago for the past three years, previous to which time he was manager at La Junta, Colo.

Managers Appointed.—Miss Clara Thompson, Waynesboro, Ga.; Mr. T. J. Lovett, Lafayette, Ind.; Mr. Carl Chapman, Franklin, Ind.; Mr. R. E. Cooney, Richmond, Ind.; Mr. M. D. Grubbs, Paducah, Ky.; C. E. Spivey, Tulsa, Okla.; Frank C. Bagby, Grand Island, Neb.; W. Shiflet, Conneaut, Ohio.

H. C. Shaw, Division Electrical Engineer, Postal Telegraph-Cable Company, San Francisco.

Mr. H. C. Shaw, division electrical engineer, at Chicago, who was on July 1 appointed division electrical engineer of the Pacific Division with headquarters at San Francisco, as briefly announced in the July 1 issue, was born in Ohio, December 23, 1875, and studied telegraphy while employed as messenger in a railroad office at Hudson, Mich. He was first employed by the Postal Telegraph-Cable Company at South Bend, Ind., in 1894, and subsequently served as operator and chief at Omaha, Neb., Denver and Colorado Springs, Col., and Chicago.

In 1903 he became manager of La Junta, Col., a repeater station, and in 1905 was transferred to the managership at Salt Lake City. In 1907 he was appointed division electrical engineer at San Francisco, his headquarters being transferred to Chicago in 1911. Now, after six and one-half years in Chicago, he has been returned to California, the land of his adoption and desire.

John W. Jackson, aged fifty-five years, chief operator for the Postal Telegraph-Cable Company at Spokane, Wash., died June 18, of heart failure.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Liberty Bond Subscription.—Twenty-one thousand employes of this company subscribed for Liberty Bonds, the amount being $1,825,000. Mr. Lewis Dresdner, treasurer of the company, has this matter in hand. The officials feel gratified at the splendid showing made.

Mr. T. W. Carroll, general manager of the Eastern Division, New York, is making an extended trip throughout his division.

Mr. Samuel R. Crowder, equipment layout engineer, New York, was married at Englewood, N. J., Wednesday, June 27, to Miss Teressa Roberta Matthews.

Mr. W. G. Peebles, manager of the Western Union Telegraph office at Atlanta, Ga., has been elected chairman of the telegraph trade section of the International Association of Rotary Clubs, succeeding W. C. Carswell, manager of the Western Union, Topeka, Kan., office.

Mr. T. B. Kingsbury, manager at Norfolk, Va., has been transferred as manager to Buffalo, N. Y.

Mr. B. N. Roney, manager of the Bloomington, Ill., office has been advanced to the management of the Terre Haute, Ind., office of this company.

Mr. A. W. Craighead, chief operator at Houston, Tex., has been appointed division wire chief at Dallas, vice I. D. Hough, resigned.

Appointments to Signal Officers' Reserve Corps.—The following employes of this company have been appointed first lieutenants of the Signal Officers' Reserve Corps: J. A. Hart and W. A. Wallace of the office of vice-president W. N. Fashbaugh; M. H. Stockberger and C. B. Glann of vice-president G. M. Yorke's office, and J. D. Felsenheld of the office of Mr. J. F. Nathan, general superintendent of the Metropolitan Division. Mr. A. A. Clokey of vice-president Yorke's office has been appointed captain.

The Morse Electric Club will omit its usual summer outing this year on account of the war conditions, but will probably hold its regular fall dinner.

Mr. Conrad O. Fretheim has been appointed Morse supervisor in the Sioux City, Iowa, office.

Mr. E. M. Canada, manager at Charlotte, N. C., has been promoted to the managership of the Norfolk, Va., office, vice T. B. Kingsbury, advanced to the managership of the Buffalo, N. Y., office.

The Earnings Report of this company for the six months ended June 30, 1916 and 1917, shows the following results:

	1917	1916
Total Revenues ...	$36,422,757.00	$29,244,150.00
Maintenance Repairs, and Reserved for Depreciation	$ 4,468,524.00	$ 3,930,650.00

*Other Operating Expenses, including Rent of Leased Lines and Taxes	24,462,681.00	18,668,462.00
Total Expenses	$28,931,205.00	$22,599,112.00
Balance	$ 7,491,552.00	$ 6,645,038.00
Deduct Interest on Bonded Debt	665,925.00	665,925.00
Net Income	$ 6,825,627.00	$ 5,979,113.00

*Includes special payments to employees for first half of 1917.

THE CABLE.

Mr. Dennis O'Sullivan of the Western Union cable station, Valentia, Ireland, has been retired. He was in active cable service since 1866 and was held in high esteem.

Thomas T. Hagen, chief operator of the Anglo-American Telegraph Company's (Western Union) staff, St. Pierre, died May 17.

New Censorship Plan.—A new censorship plan has been adopted by the government, and a widespread extension of it is under consideration. In effect it provides for the strictest possible scrutiny of all outgoing cable messages and a virtual lifting of the censorship of incoming press cable dispatches. The outgoing censorship will apply more particularly to commercial messages.

Bars New Cable Codes.—Hon. Josephus Daniels, Secretary of the Navy, has refused to accept the suggestion of the Merchants' Association of New York that for censorship purposes a division be made between the eastern and western hemispheres and that the use of distinctively American codes be permitted on this side of the Atlantic. Mr. Daniels says further extension of the list of codes is not practicable.

Test Words in Cablegrams.—A test word is permitted in any cablegram addressed to or sent by a bank, firm or organization which is qualified by complying with the United States censorship regulations already issued. Where a test word is used it will be the first word of the message.

[A test word is a word of a private code used by financial institutions or firms and their correspondents to indicate the amount of money to be paid.]

James Hamilton, Manager, Western Union Telegraph Cable System, Liverpool, England.

Mr. James Hamilton, northern district manager of the Western Union Telegraph-Cable System, with headquarters at Liverpool, England, was born in Belfast, Ireland, December 8, 1867. He entered the telegraph service in Bristol, England, February 16, 1885, and soon received an appointment as operator in the British government telegraphs. He spent fifteen months as operator in Egypt with the Nile expedition. November 17, 1890, he was appointed relay operator for the Western Union Telegraph Company in England and on January 1, 1893, was promoted to be cable operator. He became traveling representative for the United Kingdom on November 1, 1903, and on July 1, 1914, was appointed southern district manager in England. On January 20, 1916, he was promoted to his present position.

CANADIAN NOTES.

CANADIAN PACIFIC.

Mr. H. Bott of Toronto has been advanced to the position of inspector, with headquarters at Edmonton, Alta.

Mr. Frank E. Camp, formerly inspector at Brandon, Man., for the past year or more in overseas service, has been transferred to Bramshott Camp, London, as chief signal officer. Mr. Camp is the son of Wm. J. Camp, assistant manager of telegraphs at Montreal. Eric, the younger son of Mr. Camp, has joined the Royal Aviation Corps and is stationed at Toronto, where he is being trained in that branch of the service.

This company is erecting a new copper wire between Montreal and Halifax.

GREAT NORTH WESTERN.

All trunk lines out of the Great North Western, Montreal office, are now worked automatic except the Halifax circuit. The Montreal-St. John wire was recently transferred to the automatic equipment.

Eight motor generators will replace the present storage battery in the Quebec office of this company.

Montreal's third concentrator will be placed in service this month. This consists of a standard eight-position steel table, which concentrator equipment is installed for sixteen way wires. With the completion of this equipment Montreal will have all way wires under selector call. A three-channel multiplex will soon be established between Montreal and Bay Roberts, N. F., for handling cable business. This will be the first multiplex installed in Canada.

THE TELEPHONE.

Mr. M. P. Poindexter, Jr., of the Western Union Telegraph Company, Lynchburg, Va., has accepted a position in the engineering department of the Chesapeake and Potomac Telephone Company with headquarters at the same place.

Mr. Frank H. Fay, of the office of General Superintendent of Plant of the American Telephone and Telegraph Company, New York, has been commissioned a first lieutenant in the Signal Officers Reserve Corps. Mr. Fay served in Company A. New York National Guard Signal Corps for five years, and was on the border at McAllen and Mission, Tex., for six months last year.

John H. Cahill, former vice-president and general counsel of the New York Telephone Company, died in New York, July 5. He was in the telephone service for thirty-five years, but retired six years ago.

Merger of Telephone Companies.—The merger of the New York Telephone Company and the Atlantic Coast Telephone Company, which operates in Atlantic City, N. J., and vicinity, was approved June 29.

Battalion of Pacific Telephone Employes—The Pacific Telephone and Telegraph Company has contributed 210 officers and employes to the Eighth Telegraph Battalion of the Signal Reserve Corps. D. P. Fullerton, general superintendent of plant, organized the battalion and was recently appointed a major in the Signal Corps.

Heavy Submarine Telephone Cable.

The twelve-conductor telephone cable recently laid across Vineyard Sound to Martha's Vineyard Island is one of the heaviest ever employed for transmission purposes. It weighs 10.6 pounds to the foot and is 2.8 inches in diameter, the size and weight being considered necessary on account of the strong tides encountered in the sound. The Nantucket cable carries six conductors and weighs about five pounds to the lineal foot. The lead sheath in each instance is five thirty-seconds of an inch thick and heavily insulated with jute roping and armor wire.

Emergency Telephone Service.

The telephone company, in its admirable campaign for simplifying life, has recently devised a system of emergency calls whereby it is no longer necessary to give a number. All one has to do in case of a conflagration, for example, is to remark: "I want to report a fire." Anyone urgently desiring an officer of the law has only to say: "I want a policeman"—and presto! the bluecoat appears. And if one has had the worst of an encounter with the cook, he has but to moan: "I want an ambulance."

But here the system, excellent as it is, stops short. This seems to me a pity. I do hope that the benevolent telephone company will some day put in an extension to cover still other emergencies of life.

For example, when somebody with an overflowing ego takes up a seemingly all-night abode in my living room, I'd like to be able to go to the telephone and call: "Hello! I want an assassin."

When my landlord and grocer and baker become unduly obtrusive, it would be ever so handy if I could call: "Hello! I want to report an insolvency. Please send a bullion wagon."

And when the dreariness of solitary existence reaches a climax, it would be a decided convenience to be able to call: "Hello! I want a wife." Fancy the pleasurable thrill of waiting while this call was being answered! The operator at "Central" would ring up "Information" to find out what were my amatory preferences as stated on the back of my contract, and she would be told that I had stipulated "blue eyes, auburn hair, medium plumpness," etc. Then she would consult the file of female applicants for wedding service. In an almost incredibly short time an emergency limousine would draw up at my door and out would step a bride. If, by chance, I should find that "Central" had made a mistake, I should only have to say: "Pardon me, but this is the wrong number." Otherwise it would be: "Oh, so it's *you*. I've been trying to get you for a perfect age!"

And the next time anyone attempted to ring me up, the report would probably be: "Busy—don't answer."—*Judge*.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. David Sarnoff, commercial manager of the Marconi Wireless Telegraph Company of America, New York, was married July 4 to Miss Lizette Hermant of New York. A reception and dinner at the Broadway Central Hotel followed the wedding. Mr. and Mrs. Sarnoff will spend some time on Shelter Island, and then return to Woodhaven, L. I., to live.

Wireless Operator Saved.—Philo Dodds, wireless operator on the steamer "Addah," which was torpedoed on June 15, was among those picked up by a French liner. He hailed from Halifax, N. S., and was formerly employed by the Western Union Telegraph Company at Frederickton, N. S. He, with others of the crew, were exposed to the fire of the submarine while in the water.

Large Order for Wireless Equipment.—The Kilbourne & Clark Manufacturing Company, of Seattle, Wash., has, according to information from that city, been awarded a contract for the construction and delivery within nine months of 250 additional radio transmission telegraph sets, to cost $988,800, which, with the contracts from the government, already held by the company, brings the total to 315 sets, at a total cost of $1,112,000. The contract calls for 200 one-kilowatt radio transmission sets and 50 two-kilowatt transmission sets for the use of the Navy Department.

Another Brave Wireless Operator.

The fortitude of wireless operator L. F. Larson in sticking to his instrument made possible the rescue of forty-six men out of fifty on the American steamer "Orleans" when she was torpedoed unawares by a German submarine, July 3, according to a statement made by Capt. Allen Tucker, commanding the vessel. The captain said, "The torpedo burst with such force that it seemed to tear the ship asunder. L. F. Larson, our wireless operator, was sitting in his cabin and sending off S O S calls as coolly as though they were merely commercial messages. He finally got into radio touch just as the stern began sliding under the water. I ran in, pulled him out on deck and practically threw him overboard, knowing he could swim. Then I followed, and we both swam like hell to get away from being dragged under the sinking ship.

"The 'Orleans' sank within ten minutes."

Service Signals in Sending Wireless Messages.

In transmitting wireless messages service signals are employed to indicate the nature and different parts of a message. They consist of:

(1) Prefix, indicating the nature of the message, for example:

"P"—(Paid).

"A"—(Service).

"MSG"—(Master Service Message).

(2) Rdo—(Abbreviation for "Radio").

(3) M—(Abbreviation for Morning).

S —(Abbreviation for Afternoon and Evening).

(4) —...— (Double dash signal). The only punctuation used is the double dash signal, —...—, between the address and text, and between the text and signature; if service instructions are transmitted, the double dash signal —...— is also employed between the service instructions and the name of the addressee.

EXAMPLE.

P3 13 Rdo, ss Comal 430M. Fred Davis, 42 Broad St. New York.
—...—
Arrive Monday meet boat if possible.
—...—
Jack

The words "HR" (another message), "NO" or "NR" (number of message), "CK" or "WDS" (number of words), "FM" (from) and "TO" are not transmitted.

The long numerals are generally used in wireless in giving the number of words in a message and in transmitting figures appearing in radiograms. However, short numerals may also be employed to express figures, but only in official repetitions and in the preamble, and in the text of radiograms written entirely in figures.

The short figures are as follows: 1 .— 2 ..— 3 ...— 4 .. .— 5 . 6 —.... 7 —... 8 —.. 9 —. 0 —

The comma in Continental is dot, dash, dot, dash, dot, dash (dot, dash three times). This is the same as the Morse, with an additional dot, dash.

Employment of Radio at the Front.

The Wireless Age gives an interesting account of the use of wireless in the war, the description being furnished by a Russian officer of one of the mobile field outfits operating near the front.

The whole wireless station can be unloaded from its auto truck, rigged up and be ready for work in twenty minutes. The seventy-foot masts are hollow and made in sections which are screwed together when taken off the truck.

Often it is absolutely quiet outside in the starry night around the station. Not a shot breaks the stillness. But through the operator's telephone comes the uproar of rifle and machine guns, and the bombardments of the heavy batteries, for messages are telephoned to him for transmission from dugouts right up on the firing line of the front, twenty or thirty miles away.

These little stations catch the entente's daily communiques, and those of the German and Austrian general staffs. They come at definite times. Sometimes one sees the operator hurriedly finishing a meal or refusing a third glass of tea. He explains that French headquarters will want to talk with him in a few minutes. And, sure enough, in a few minutes along comes France's communique. It is odd to stand a little way off and, glancing at the forlorn canvas hut and its two sticks, lost in the drifted snows, with no other signs of life, hear the aerial voices of all Europe.

The longest official communiques sent through the air every day are those of the Germans. They are signed by Ludendorf. From Germany, too, every day comes the Radio Gazette, in condensed form—a sort of aerial condensed newspaper, which is dilated and worked up into the daily flysheet newspapers distributed to the German troops on all the fronts.

The station does not have much to do at times of lull on the front, as then all the staffs are linked by telephone and telegraph wire. Its busy times come during the battles.

Some of the mobile stations do much service with floating cavalry units, by which they are prized. During the great Russian advance in Volhynia and Galicia last summer, for instance, cavalry squadrons kept in touch with their bases while pursuing the retreating Austrians almost exclusively by means of these auto wireless outfits that accompanied them wherever they went.

Unshunted Ammeters for Wireless Telegraphy.

An interesting recent development is the unshunted hot-wire ammeter for the highest frequencies used in wireless work. Ordinary shunted hot-wire ammeters, when used for current of 1,000,000 cycles show very large errors. The new "hot strip" ammeter has a group of thin platinum-iridium strips arranged as elements of a cylinder, the ends of the strips being connected to two copper disks, which are part of the line terminals. The current passes straight through the instrument, avoiding loops, and since the strips are symmetrically placed there is no tendency toward change of distribution of the current, due to change of frequency. The uppermost strip is used as the expansion element in place of the usual wire. These ammeters are made up to 300 amperes.

Effect of Moon on Wireless.

Mr. J. W. Cohen, a wireless expert, states that while stationed in the tropics for several years as a wireless operator he observed that in the period of the full moon the atmospheric interferences are slight and the ether seems to carry the wireless waves with less absorption than when the moon is in its quarter periods. With the full moon he could receive signals from stations two hundred miles farther away than when the moon was in the first and last quarters. He also noted that the atmospheric conditions were better between December and April.

A BRIEF STAY.—A newspaper in a western city announces Mr. So-and-So, chief operator, of the Western Union Telegraph Company, of the same city, was a recent brief Palm Beach visitor. The hotel rates were $15.00 a day, hence the brief sojourn.

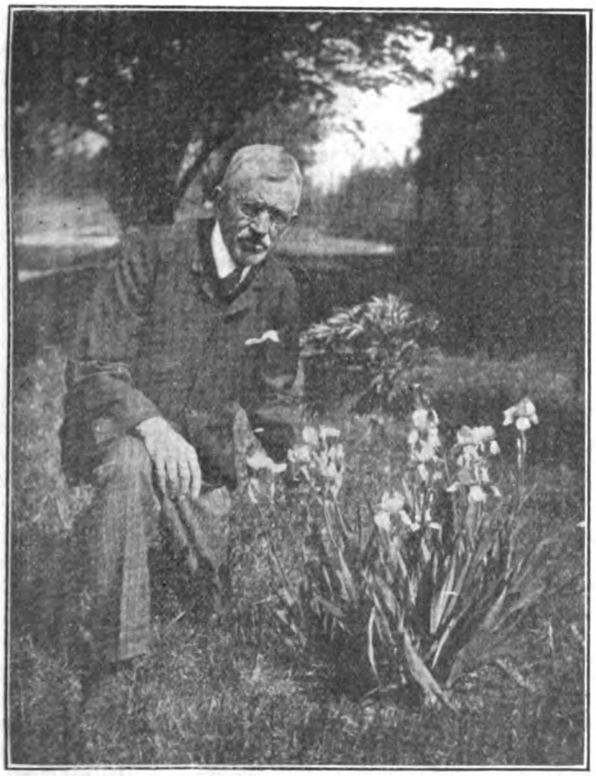
Mr. J. M. Barnes, of St. John, N. B., Canada, in remitting to cover his subscription for another year, writes: "I appreciate the AGE very much and am always glad when it comes. I hope you may be spared many more years to give us our semi-monthly feast."

Jeremy G. Case.

In the June 1 issue we recorded the fact that Jeremy G. Case, formerly one of the most prominent figures in telegraph circles, had recently visited many of his old friends in New York. The appearance of this personal item has caused inquiries to be made regarding Mr. Case, who was so prominent in his day, but who had seldom been heard from by any of his former telegraph friends since he severed his connection with the telegraph, some thirty-odd years ago.

The old friends of Mr. Case will be glad to know that he is hale and hearty. He resides at Kirkville, N. Y., in the summer time and makes New York City his place of residence during the winters.

Mr. Case was born in Onondaga County, N. Y., in 1845, and a history of his telegraph career will prove exceedingly interesting to the present generation of telegraph people. He became an operator in the early sixties and in 1864 was a member of the force of the Independent Telegraph Company's main office on Nassau Street, New York, when every one identified with the service in the various cities connected by the system was placed under arrest on account of the alleged complicity of the company in transmitting a bogus proclamation calling for 300,000 additional troops, which affected the gold market. The instigator of the forgery was Joseph Howard, the well-known newspaper man. Mr. Case escaped arrest and imprisonment by passing the soldiers in the office door while going off duty. The history of the Independent Telegraph Company's controversy with the government growing out of this incident has several times previously been printed in these pages.



JEREMY G. CASE.

Mr. Case always worked for opposition telegraph companies and was as well known in Wall Street as any man of his day.

Mr. Case was looking over the shoulder of Mr. Frank Brown, the operator, while the latter was receiving the message from Washington announcing the assassination of President Lincoln. He immediately concluded that the rebels had tapped the wire and sent this message as a joke and the message was regarded as a hoax and thrown into the paper basket. All the wires into New York were immediately severed by the conspirators and the assassination of the President was not confirmed until the next morning.

Mr. James D. Reid in his "History of the Telegraph" had the following to say about Mr. Case's enterprise in the formation of the Bankers' and Merchants' Telegraph Company, in which he was the moving spirit from the beginning to the end of that once well-known and much talked about telegraph company.

"When the American Union and Western Union Telegraph Companies united their fortunes in January, 1881, Mr. Jeremy G. Case and Mr. J. Heron Crosman of the firm of F. M. Lockwood and Company, New York, were on a shooting excursion in North Carolina. Mr. Case had been connected with opposition telegraph lines in New York almost from their origin. He took to telegraph fights with the same instinctive delight with which an Irishman takes to a 'shtick.' His companion had an eye open to betterments. Although their bags were well lined with partridges, these gentlemen, on their way to their plantation quarters, on passing a small telegraph office on the Raleigh and Gaston Railroad, could not resist the temptation to get the last markets from New York. With the usual quotations came the news of the telegraphic consolidation which had just been perfected. Mr. Case at once smelt the air of the old battlefield.

"True to his instincts, Mr. Case at once proposed to his companion that they should return immediately to New York and, taking advantage of the excitement which the consolidation of the leading companies was certain to cause in New York and elsewhere, start an opposition line. As they walked and talked the project grew and broadened. It was thus that the plan of the Bankers' and Merchants' Telegraph Company came to be formulated by these two gentlemen while tramping, gun in hand, through the woods of North Carolina. The northern game seemed vastly more worth bagging than even southern deer.

"On arriving in New York, Mr. Case, who was at home on Wall Steeet, and who had long served in connection with telegraph rivalries there, at once opened a subscription for stock in the new company, asking only $75,000 for a line of twelve wires to Philadelphia. The apparent modesty of the sum was attractive. With a keen knowledge of the men from whom he expected funds, he limited subscribers to $2,500. This implied that there was not enough to go round. The list was soon full of responsible names and steps were at once taken to hasten construction.

"The Bankers' and Merchants' Telegraph Company was formally organized under the general laws of the State of New York, March 22, 1881, with a capital of $1,000,000. Incorporators: Jeremy G. Case, J. Heron Crosman and Garrett S. Mott. The company was organized by electing W. W. Maris, president; A. W. Dimock, vice-president; J. G. Case, secretary and treasurer, and Garrett S. Mott, general manager. The president and vice-president were to receive no salary and it was designed to avoid all 'red tape,' to have no way offices, but to do a rapid and special business in connection with several leading interests at a very moderate tariff. A number of wires were to be reserved to be leased to business houses.

"In the spring of 1882 the lines were extended to Washington. Lines were soon projected and completed to Pittsburgh, Cincinnati, Indianapolis and other western cities."

Mr. Reid then goes on in the "History of the Telegraph" to describe in detail the rapid development of the Bankers and Merchants' system by consolidation with many other small companies. All went well until 1884, when the panic of that year brought disaster to the new enterprise and the president of the company, A. W. Dimock, was unable to weather the financial storm. Edward S. Stokes of New York bought the property at auction and the United Lines Telegraph Company was organized as a result. After a few other shifts in the scene the property became merged into what is now known as the Postal Telegraph-Cable Company.

Mr. Case was identified actively in the management with most all of the opposition telegraph companies of his time. These included the Independent Telegraph Company, the United States Telegraph Company, Atlantic and Pacific Telegraph Company, the Pacific and Atlantic Telegraph Company, Franklin Telegraph Company, Automatic Telegraph Company, Continental Telegraph Company, American Rapid Telegraph Company, Southern Telegraph Company, Baltimore and Ohio Telegraph Company, The Commercial Telegram Company as well as the Bankers and Merchants Telegraph Company.

Notes on Dry Cells.

The most commonly used type of battery for "open circuit" magneto telephone exchange service is the dry battery, which in reality is a moist battery containing substances capable of retaining moisture for considerable time. It is used in telephones for supplying current to the transmitter circuit, and night alarm circuit; also used in connection with pole changers for ringing telephone bells. Carbon is the positive electrode and zinc the negative electrode.

By internal circuit is meant the path between the two electrodes within the cell. By external circuit is meant the path from one electrode to the other outside of the cell.

The cells used for these purposes are six inches high by two and one-half inches in diameter and weigh two pounds.

The zinc in a good grade of cell is .02 inch thick. The short life of cells while in use may be due to inferior chemicals or poor grade of carbon and zinc. Deterioration of cells not in service is due to local action caused by inferior chemicals and poor grade of carbon and zinc. New cells should give from fifteen to eighteen amperes discharge on short circuit for about five seconds.

Drying out of cells increases the resistance. The higher the internal resistance of cells the lower the current output. Do not place cells near radiators or steam pipes as it causes them to dry out and thus shortens the life. To be kept in storage for an unreasonable length of time will also shorten the life. Drying out is also caused by cracks in the sealing compound when extended down far enough.

If current is supplied at a low rate the life of the battery will be longer. The voltage test of cells on open circuit is misleading, as the internal resistance may be high and still give full voltage reading.

Never group cells so they are in contact with each other. The moisture absorbed by the pasteboard cover of a cell due to its zinc having been eaten through may moisten the cover of an adjacent cell and cause a short circuit.

Beware of Static Electricity When Around Automobiles.

A curious story of a fire, caused presumably by static electricity, comes from Dubuque, Iowa. A resident of that city, wearing a fur coat and rubber boots, walked hurriedly to his garage on a cold morning recently. He did not realize that his movements were storing up a dangerous amount of electricity in his body. But the fact was the friction of his arms against the coat caused a certain amount of static electricity to be generated, and this was stored in the man's body because it was insulated from the ground by his rubber boots. When he sought to prime the motor of his car with a mixture of gasoline and ether, using a metal squirt can—probably of copper, which is a good conductor of electric current—the can was brought so close to the motor that a spark was produced between it and the priming cup, igniting the gasoline. The can exploded, throwing the flaming liquid over both man and car. The man escaped with severe burns, but the car and garage were completely destroyed.

The Telephone in Hawaii.

Although Hawaii does not have snow and sleet storms, the telephone companies on the islands experience considerable difficulty with the "kona," or south winds, as they are commonly called. These winds last for several days at a time and create havoc with the telephone lines, the poles, wires and cross-arms all yielding to them. These wind storms occur periodically, about once in every five years, and usually nearly a week is spent in repairing the telephone lines after such a storm has passed.—*Telephony.*

Efficiency Engineering in the Telegraph Service.

(Continued from page 298, July 1.)

Are you a procrastinator? Your answer of course will be, emphatically, no. But are you a procrastinator? Let us analyze what this means. A manager or a chief operator is at the elbow of every employe, swinging the motto "prompt service." These officials see that the telegraph machinery is oiled by the best lubricant obtainable so that everything may run smoothly. The superintendent writes to the manager asking for important information of a local character covering an extension of telegraph facilities. The manager reads the letter, lays it aside to be answered later. He then proceeds to see that everyone is in his place and everything is moving regularly. This would be satisfactory if it would stop there, by trusting the conduct of the affairs of the company to the subordinate officials in order to give his entire attention to local executive matters. A quad chief naturally resents a chief operator's suggestions as to better methods of balancing a quadruplex set during wire trouble. He has problems on his mind and he does not wish to listen or waste time in arguing with the chief operator or anyone else. It is his business to restore communication as quickly as possible and the head of the operating department should never embarrass him. Permit everyone to work out his own salvation according to his own methods which are usually up to date and the best that brains can furnish.

When managers and chief operators become meddlesome they become the subjects of anxiety by their official superiors. The manager who has the important letter to answer previously mentioned, permits it to lay on his desk until the afternoon of the day following. He then answers it because he is in receipt of a telegram from the superintendent urging a hasty reply. It probably has to go by wire because of its importance. The letter might just as well have been answered the day previous.

Suggest to the manager that he is a procrastinator and he will reply to you in very emphatic terms of a negative character. He recalls visiting everyone and seeing that every department was well taken care of the day previous so that the public's business would be expedited. He realized the necessity of pleasing the business men who support the telegraph. At the same time he neglected to answer a letter from his superintendent, the very man who has his eyes on him all the time. The superintendent began to wonder if the manager gave the public's business the same treatment that official matters received.

This manager was no doubt far above the average in all essentials except one and that one branded him as a procrastinator and really lowered his business qualifications in the estimation of his superior official. It makes no difference how urgent a manager may deem it necessary to personally supervise daily the delivery, the receiving, the operating and other departments, he can always spare the time to attend to his important communications. If he has not the time, he should turn the task over to someone else who has.

One of the general superintendents of one of the large companies went on public record once that in many offices managers would permit their mail to accumulate until four or five o'clock in the afternoon when they would dictate a dozen or more letters to a stenographer who had done nothing all day. The stenographer was then compelled to work until seven o'clock to finish the mail which should have been written before noon.

We have been asked several times to state whether it is efficiency when telegraph communication is suddenly interrupted to pack up the accumulated messages and send them to a neighboring city which can be reached in two or three hours by fast express train. This has been termed a "suit case telegraph" service. A manager should have no scruples in explaining a condition of this kind to his customer who happens to bring the subject to his attention. Telegraph companies cannot foretell total interruptions to business. Such interruptions do not happen except on rare occasions, not oftener than once in five years. If during such an emergency a repeating office has on its hooks to be sent several hundred messages and the break can be bridged by an express train in from two to five hours it is decidedly an act of efficiency to forward the messages by special messenger, "suitcase telegraph" if you wish to call it so. A manager or chief operator who would issue an order to carry out a proposition of this kind should be commended for his judgment. He not only has done his own company a service, but he has expedited the delivery of public business. There is certainly not the slightest reason why an official should not, if called upon to do so by his customer, explain such a condition. The customer would naturally commend him and the company he represented for being alive to the importance of carrying his communication as far as it could by wire, bridging a break by speedy train service and then wiring his business to its destination.

No well balanced official, no matter how strong his religious scruples may be, should imagine for a moment that it was even necessary to explain to a customer in San Francisco or Seattle that his telegram sent to Philadelphia, owing to an interruption in the wires between that point and New York, was forwarded by special messenger from the latter city to the City of Brotherly Love. The same argument used holds good in cablegrams from London and we might say that business originating at points less distant than those mentioned should be treated in the same manner.

Telegraph companies, it must be remembered, have no facilities to mail business or handle it at long range by special messengers as many allege. We venture the assertion that the so-called "suitcase telegraph" has not been resorted to five times in twenty years, but in every instance it expedited the public business.

(To be continued)

THE UNITED STATES CIVIL SERVICE COMMISSION will hold competitive examinations for junior telegraph and telephone engineer and junior signal engineer at the usual places on July 25. The salaries for these positions range from $720 to $1,680 per year.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telephony.

THE CONDENSER.

A condenser consists essentially of two metal plates separated by an insulator. In the ordinary telephone condenser the metal plates are of thin sheets of tin foil and the insulator paraffined paper. In most cases the amount of material necessary would be altogether too large to use spread out flat, so that in order to save space the sheets of tin foil and paper are rolled into a cylindrical form. As it is necessary to be sure of having no electrical connection between the two sheets of tin foil rolled up in this way, two paper insulators are used. Metallic connectors are brought out from each of the tin foil plates to two terminals and the rolled condenser is placed in a metal case to protect it from injury. The end of the case where the terminals come through the holes in the metal cover is sealed with a moisture-resisting wax, for if the paraffin paper were permitted to absorb moisture it would lose its insulating properties, thus destroying the usefulness of the condenser. In Fig. 1 three stages in the manufacture of a condenser appear; (A) a condenser partially unrolled to show the alternate layers of the foil and paper, (B) a condenser ready for assembly in the case, and (C) a completed condenser.

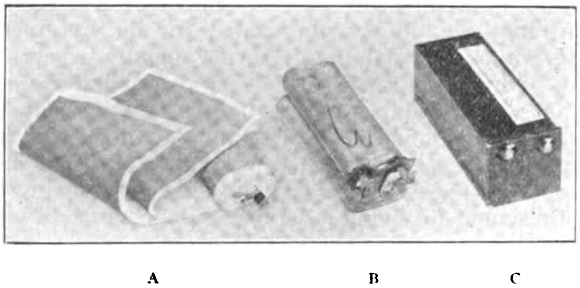


FIG. 1—PARTS OF A TELEPHONE CONDENSER.

If a source of electric current having a certain pressure or tendency to flow be connected to the terminals of the condenser, a quantity of electricity will flow into the condenser until the electrical pressure at its plates is the same as that of the source. If the source of current is then removed, this electrical energy will remain in the condenser and will have the same pressure or tendency to flow as before the removal of the source. Under these conditions the condenser is said to be "charged." If a metallic connection is then made between the terminals, this pressure will cause a quantity of electricity, equal to the amount which previously flowed into the condenser, to flow from one plate to the other. When the pressure has decreased to zero the condenser is said to be "discharged."

(To be continued)

QUESTIONS IN TELEPHONY.

What is the alternating current used for in the telephone?

When the receiver is on the hook, is the talking circuit open or closed?

At what times is the alternating current sent over the wire?

Radio Telegraphy.

KEYS.

In the smaller sizes of radio sets the current from the alternator to the transformer can be controlled by ordinary types of Morse keys, with either silver or platinum contacts, without troublesome sticking, trailing, or arcing even at fast sending. In the larger sizes, however, special means of cutting down the arc at the breaking of the circuit must be used, such as shunting the key by a resistance, condenser, reactance, etc., so that the key does not break the whole current. In this case, however, it must be remembered that, as these shunts always allow some current to flow through them, the high tension and high frequency circuits are alive and it may be dangerous to touch any of them. In the largest sets a relay key is generally furnished which consists of an electromagnet the windings of which are in series with an ordinary Morse key and a source of direct current and the armature of which carries the heavy contacts necessary to break the current in use. Such a key may be used to break a current of fifty or sixty amperes or more without injurious sparking. In some cases a single large key with contacts an inch or so in diameter and a handle a foot long has been used.

Another type of key is coming into use, known as a "break key," which permits the receiving operator to break the transmitting operator as on a wire line. Among other ways this may be accomplished by providing the ordinary key with an extra set of contacts which, just after the current has been broken in making a dot or dash, and just as the key handle comes up to its final position, automatically connects the receiving circuit to the antenna and ground without the necessity of throwing a special switch. At any time that the receiving operator misses a word or desires to "break" the transmitting operator he holds his key down or calls "bk" and the transmitting operator with the telephones on his head and with his detector in adjustment will hear the call between the dots and dashes of his own sending and thus be broken. For most successful use both operators should be provided with break keys. It is essential that the receiving circuits in general and the detector in particular be protected from sparks from the transmitting circuits, and that the operators be not bothered by the sounds from their spark gaps or machinery.

QUESTIONS IN RADIO TELEGRAPHY.

Is the power delivered to the transformer increased or decreased by increasing the resistance in the rheostat?

Does increasing the reactance necessarily cut down the power?

Why does the increase of reactance sometimes cause an increase in the antenna current?

Telegraphy.

THE DYNAMO MACHINE.

The dynamo machine, or "generator" as it is now more properly called, was first extensively used in telegraphy in this country to take the place of gravity battery previously used, to furnish the current required in the main office of the Western Union Telegraph Company in New York City, in 1880. It is now employed for a similar purpose in many other large telegraph offices in this country.

Not more than three or four circuits at most can be advantageously worked from one gravity battery. This is due to the fact that the variation in the strength of the current furnished by this form of battery, when many line wires are being fed from one of them, renders signals unsteady. This variation of the current strength is due to a constantly changing external resistance, caused by the opening and closing of the wires in the act of operating them. When a source of electromotive force having a very low "internal" resistance is employed, the fluctuations of the external resistance do not materially affect the amount or strength of current supplied to the various wires forming the external resistance.

An explanation may be useful here, of the causes which lead to this variation of current strength when gravity batteries are employed, and of the statement just made, namely, that, with a source of electromotive-force having low internal resistance, this variation would not occur. But, as to a proper comprehension of the subject, a knowledge of the laws of the "joint" resistance of circuits, and of the distribution of current strength in divided circuits, is essential, reference will first be had to those laws, before proceeding with the explanation.

(To be continued)

Shop Talk.

BY THE OBSERVER.

After watching the results since the institution of the dispatcher, I must report progress. How many of us recall the many times we required help on certain business, but when we would ask for help, maybe we secured it and maybe we did not. But we get it now and there are no more waits and hard luck stories. When all wires and circuits are O. K., the dispatcher's life is comparatively an easy one, but when there is scattered trouble, his path is one of thorns and brambles. Now we can help the dispatcher in many ways. We can, by a little thought, see which circuits he classifies as "extra" important circuits, for all circuits are important, or they would not exist. Now when there is trouble on any circuit and you can patch it, I would suggest that you do not rush to the dispatcher wire and yell out the first sign of trouble, if you have a patch, but that you patch it and do it as quickly as possible and then tell him the full story. In this way he will know what use the two wires are in and record accordingly. In making reports be as brief as is consistent with a clear narration. Whenever the dispatcher gives you an order verbally and you think it is wrong help him by a counter remark but if he sticks to his order, do it and do it at once for he has not time, nor is it necessary that he give you his reason. However, I will say that at times I have seen some circuits established that I thought were rather odd. Curiosity prompted me to investigate and I found that owing to wire trouble in sections which I had no way of reaching, that the supposed odd circuits were about the only practical way a circuit could be established. Therefore, co-operate with the dispatcher and do it with alacrity. One great fault I find is the abuse of circuits due to swings. Perhaps, it is a day when the wind is blowing a gale. Maybe seventy-five per cent. of the wires on a certain route are down and because one of the fast wires hits once or twice, in an hour, it is boarded. A report is rushed to the dispatcher and he must arrange some way to detour the business, or the circuit. The wire chiefs watch the wire for a half hour; maybe they get a hit and maybe they do not; the wire is restored and then it must all be done over again. Now whenever there is a route that carries several wires and only one of them swings, the swing should be located, no matter how hard the wind; but if most of a route is already out due to swings, then I say the wires that are safe for business should be worked. A swing that hits two or three times an hour will not justify killing a manual circuit. Now if there is more than one wire on a route and only one wire is swinging, but very slowly, and you wish to locate it with a minimum loss of time, cross connect it at the middle with a clear wire and see which side it is. Then you can take out, or make further cross patches until you locate it. There may be times when by swapping two circuits between two points you can improve matters. Now if this is but a temporary shift do it and tell the dispatchers why, but do not make any swaps unless necessary, and never swap without telling the dispatcher, because he gives his orders often by wire numbers, and if you swap without the dispatcher's knowledge you mix his chart. What the dispatcher wants is to maintain circuits with a minimum loss of time, the circuits to be as near 100% efficient as is possible. Never attempt any unpleasant argument with the dispatcher. If it did not result in your dismissal, it would be unbecoming of you. The dispatcher is here to stay and the amount of good service that has resulted from his efforts fully justifies the expense.

(To be continued)

Origin of the Western Union Telegraph Company.

(Continued from page 307, July 1)

CHAPTER 98.

An Act to amend an Act, entitled "An Act to provide for the Incorporation and Regulation of Telegraph Companies," passed April twelfth, one thousand eight hundred and forty-eight.

Passed April 8, 1851.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. The directors or trustees of any telegraph company formed or incorporated under the Act entitled "An Act to provide for the Incorporation and Regulation of Telegraph Companies, passed April twelfth, one thousand eight hundred and forty-eight, may, at any time, with the written consent of the persons owning two-thirds of the capital stock of such company, extend their line of telegraph, or may construct branch lines to connect with their main lines, or may unite with any other incorporated telegraph company.

§ 2. This Act shall take effect immediately.

CHAPTER 471.

An Act to amend an Act, entitled "An Act to provide for the Incorporation and Regulation of Telegraph Companies," passed April twelfth, one thousand eight hundred and forty-eight.

Passed June 29, 1853.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Any number of persons may associate, for the purpose of owning or constructing, using and maintaining, a line or lines of electric telegraph, whether wholly within or partly beyond the limits of this State; or for the purpose of owning any interest in any such line or lines of electric telegraph, or any grants therefor, upon such terms and conditions, and subject to the liabilities prescribed in the Act passed April twelfth, one thousand eight hundred and forty-eight, entitled "An Act to provide for the Incorporation and Regulation of Telegraph Companies." And such association shall, upon complying with the provisions of the said Act, become a body corporate, and shall have the powers, and be subject to the provisions in the said Act, and in the several Acts amending the same, contained, not inconsistent herewith. And any telegraph company now owning or using any telegraph line, either wholly or partly within this State, may become a body corporate, and entitled to the benefit of the provisions herein contained, on filing in the office of the Secretary of State a certificate of a resolution adopted by a majority of its board of directors to organize under this Act; which said certificate shall contain the specifications required by the said recited Act, and shall be proved or acknowledged, and recorded in the manner therein prescribed.

§ 2. Such association is authorized to erect and construct, from time to time, the necessary fixtures for such lines of telegraph, upon, over or under any of the public roads, streets and highways; and through, across or under any of the waters within the limits of this State, subject to the restrictions in said recited Act contained; and also to erect and construct such fixtures upon, through or over any other land, subject to the right of the owner or owners thereof to full compensation for the same; and if any such association cannot agree with the owner or owners of any land taken or used by such association for the compensation to be paid therefor, it shall and may be lawful for such association, or such owner or owners to apply to the county court of the county in which such lands are, by petition, stating the facts in relation thereto; and after the expiration of twenty-one days from the filing of such petition, and notice thereof given to such association, or to the owner or owners of such land, as the case may be, it shall be the duty of the said Court to appoint five disinterested persons to make a just and equitable assessment and appraisal, in the manner directed by the said recited Act of the loss or damage, if any, which may have been, or is likely to be, sustained by the owner or owners of such land, taken or used as aforesaid, whilst such land shall have been, or shall continue to be used as aforesaid. And such assessment and appraisal shall determine the annual rent or compensation to be paid by such association for such use, or in lieu thereof, a sum in gross, as the compensation for allowing the fixtures belonging to such association permanently to continue, and the same to be repaired, improved and renewed, or removed from time to time, as such association may require.

§ 3. Every such company, owning or using a line of electric telegraph, partly within and partly beyond the limits of this State, shall render to the proper officer a true report of the cost to such company of their works within this State; and the stock of such company in amount equal to such cost, or the dividends thereof, shall be subject to taxation in the same manner, and at the same rate, as the stocks or dividends of other companies incorporated by the laws of this State are subject.

§ 4. The liability of any share or stockholder in any company organized under this Act, as provided for in the Act of which this is an amendment, shall only apply to the amount due by any such share or stockholders in such company, and unpaid, on or for any such share or stock.

CHAPTER 559.

An Act to amend an Act, passed April twelfth, eighteen hundred and forty-eight, to provide for the Incorporation and Regulation of Telegraph Companies.

Passed April 19, 1855.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. The eleventh section of the Act passed April twelve, eighteen hundred and forty-eight, to provide for the incorporation and regulation of telegraph companies, is amended so as to read as follows:

§ 11. It shall be the duty of the owner, or the association owning any telegraph line, doing business within this State, to receive dispatches from and for other telegraph lines and associations, and from and for any individual, and on payment of their usual charges for individuals for transmitting dispatches, as established by the rules and regulations of such telegraph line, to transmit the same with impartiality and good faith, under the penalty of one hundred dollars for every neglect or refusal so to do, to be recovered with costs of suit, in the name and for the benefit of the person or persons sending or desiring to send such dispatch; provided that nothing contained in this section shall be construed to require any telegraph company or association to receive and transmit dispatches from or for any other company or association, owning a line of telegraph parallel with or doing business in competition with the line over which the dispatch is required to be sent.

§ 2. This Act shall take effect immediately.

CHAPTER 97.

An Act to change the name of the New York and Mississippi Valley Printing Telegraph Company.

Passed April 4, 1856.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. The name of "The New York and Mississippi Valley Printing Telegraph Company," a body corporate, organized under the general laws of this State, is hereby changed to the "Western Union Telegraph Company;" and the said company shall have the right to continue to hold and manage the property and affairs of the said telegraph company, as a corporation, by or under the name and style of "The Western Union Telegraph Company." But nothing herein shall be construed to affect any action now pending in favor of or against said company; and in case any action shall be hereafter commenced against the said company, in this State or elsewhere, by any person or party not knowing the change of the corporate name of said company, it shall not be authorized to plead a misnomer, but shall answer or plead to the merits of the action, stating in such answer the true name of said corporation; and such action shall proceed against it in either name, according to the practice of the court in which such action shall be pending; and any judgment recovered therein shall be as valid as if the action had been commenced and conducted against the said company by its true name.

§ 2. This act shall take effect immediately.

CHAPTER 425.

An Act further to amend the Act entitled "An Act to provide for the Incorporation and Regulation of Telegraph Companies," passed April twelfth, eighteen hundred and forty-eight.

Passed April 22, 1862; three-fifths being present.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Any telegraph company which is duly incorporated under and in pursuance of the Act entitled "An Act to provide for the Incorporation and Regulation of Telegraph Companies," passed April twelfth, eighteen hundred and forty-eight, may construct, own, use and maintain any line or lines of electric telegraph not described in their original certificate of organization, whether wholly within or wholly or partly beyond the limits of this State, and may join with any other corporation or association in constructing, leasing, owning, using or maintaining such line or lines, and may own and hold any interest in such line or lines, and may become lessees of any such line or lines, upon the terms and conditions and subject to the liabilities prescribed in said Act, so far as such provisions are applicable to the construction, using, maintaining, owning or holding of telegraph lines, or any interest therein, pursuant to the provisions of this Act.

§ 2. In case any company incorporated as before mentioned shall become the owners or lessees of, or engaged in the construction, use or maintenance of any line or lines of electric telegraph, not described in their original certificate of organization, or shall join with any other corporation or association in leasing, constructing, owning, using or maintaining any such line or lines, or shall own or hold any interest in such line or lines, or shall become lessee of any such line or lines, such company, within one year after constructing or becoming such owners or lessees, or after joining with any other corporation or association in such construction, leasing or ownership, or after acquiring any other interest in such line or lines, shall file in the office of the Secretary of State of this State a certificate describing the general route of such line or lines, designating the extreme points connected thereby, as provided in section two of the Act hereby amended; which certificate shall be executed by at least two-thirds of the directors of such corporation under their hands and seals, and shall be acknowledged by them as prescribed in subdivision five of the second section above mentioned.

§ 3. Any telegraph company incorporated as mentioned in the first section of this Act, which before the passing of this Act shall have purchased, constructed or leased, or shall have joined with any other corporation or association in the purchase, construction or leasing, or shall have become the owner or holder of any interest in any line or lines of telegraph not described in their original certificate of organization, may, within one year after the passage of this Act, make and file in the office of the Secretary of State such certificate as is provided in the second section of this Act, and upon the filing of such certificate, their act, if otherwise within the provisions of this statute, shall be as valid and effectual as if done after the passing of this Act, saving all existing rights of other persons.

§ 4. This Act shall take effect immediately.

(To be continued)

How Success is Achieved.

Success is only achieved by hard work. There is no formula by which lasting favor or prosperity can be secured by moderate efforts. Who will fill the vacancies in higher positions which must occur in one, two, or five years? Certainly not he who has failed to demonstrate his ability to master his present position. And even before these vacancies occur, executives are studying individuals for their fitness for higher positions. Can you, in all sincerity, expect to be selected?

Routing.*

BY JOHN A. HART, ROUTING ENGINEER, WESTERN UNION TELEGRAPH COMPANY, NEW YORK.

The benefits derived from the installation of the dispatching system emphasized strongly the need of efficient message routing throughout the country. When the dispatching system had been in use a short time, a condition that had been generally recognized for a long period became even more evident, namely, that a large proportion of the congestion occurring on our trunk circuits was caused, not by traffic originating at one of the termini of a circuit and destined for the other, but by traffic relayed over this circuit for distant points. It also became plainly evident that a great deal of this relay traffic could and actually should be diverted over other routes which were lightly loaded.

While the dispatchers keep traffic from becoming unduly congested under sudden emergencies, much of the congestion under normal conditions can be prevented by prearranged diversions of traffic when a circuit is temporarily lost or a heavy file is suddenly dumped into an office.

The present methods of routing traffic have grown with the needs of the service. Many offices have lists prepared showing the home relays for distant offices. When a message is received for a distant office it is forwarded over the most available route to the home relay of this distant office. This "most available" route for the originating office often imposes at least one extra relay in the message. Many offices also have tabulated lists showing to what points they forward certain business. These lists have been prepared according to information received from various sources and in many cases contain errors both of statement and omission. It has been impossible for the chief operators to keep them up to date as changes are made in circuit layouts. When changes are made in these lists they cover the needs of the home office only and have no regard for the needs of distant offices.

Therefore, to be efficient, a system of routing instructions must be prepared at a centralized point and from there issued to the various offices. As the necessary data for the preparation of such instructions has now been compiled in the office of the Vice-President in Charge of Traffic, then such instructions, as well as those for the normal assignment of circuits, should properly be routed from that office.

To determine the data to appear in each office a thorough study must be made. This, of course, is necessary, as instructions will be different from each office. For instance, the instructions at Portland, Me., for Los Angeles traffic would be different from the instruction at Boston for the same traffic or at Los Angeles for Boston or Portland, Me., traffic. Again the westbound route for traffic for various reasons may be different from the eastbound route for traffic between the same two points. The routing engineer's forces are, therefore, preparing a comprehensive plan for preparing and issuing instructions for each individual office. These instructions, after being prepared, will be forwarded directly to the office concerned.

The question of what is to appear in these instructions has received careful investigation and it has been finally decided to show the point for which traffic is destined with its normal relay and a first and second alternate. The study to determine the first and second alternates will be as carefully made as the study for the normal relay point.

When the instructions are finally prepared and placed in an office, it will only be necessary for the routing clerk in office "A" to determine from the list to what office a message should be forwarded. This in all cases will be to an office having a direct circuit with office "A." When the message is forwarded from office "A" to office "B" the routing clerk in office "B" will, in turn, find instructions for the further handling of the message. These instructions in all cases will carry the message straight through until it finally reaches its destination. If, at any point in the delivery of the message, it is found the first or normal route is unavailable due to trouble which is not likely to clear in a short time, the route clerk, who will be constantly informed of any shortage of circuits, will forward the message to the first alternate circuit. Upon the message arriving at the first alternate destination, proper instructions will be found for its further handling. This method will be carried through to the second alternate if it becomes necessary.

The normal route selected in each case by the routing engineer's force is determined by the number of relays placed in a delivery, an effort being made to reduce the relays to a minimum. This is sometimes impossible or undesirable due to excessive room drags, shortage of force or working conditions of circuits. When two routes are available, one a multiplex and the other a duplex, the multiplex route would be selected as the first route, other conditions being equal. On the other hand, if the multiplex circuit terminated in an office having a heavy room drag and the duplex in a small office being well manned and having facilities to the terminating office equal to those of the large office, then the duplex would be selected.

The proper routing of traffic will tend to make the whole plant more efficient. It will have the following effects:

(1) Cut down unnecessary back hauls.
(2) Eliminate unnecessary relays.
(3) Reduce cost of handling traffic.
(4) Equalize loads on important trunk lines, hence insuring greater stability of service.

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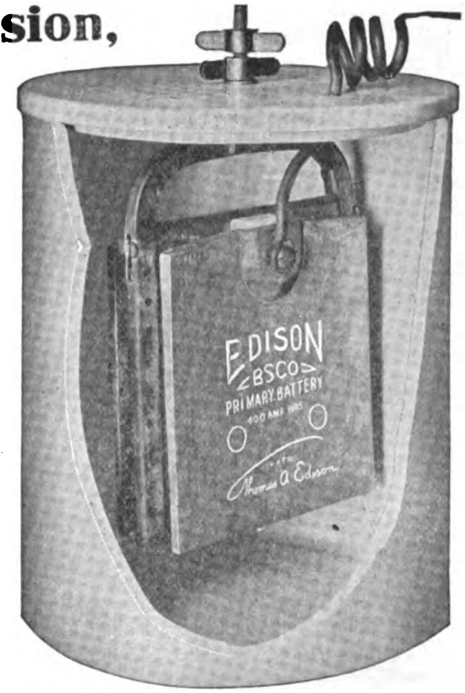
*Western Union News.

Telegraph and Telephone Life Insurance Association.

Mr. William H. Baker, president of the Telegraph and Telephone Life Insurance Association, in a circular letter to the members, announces that the matters discussed at the last annual meeting, held March 14, relative to the future of the Association, are progressing satisfactorily and that the executive committee expects at an early date to be able to place a definite and comprehensive proposition before the members for consideration, at a special meeting of the membership to be called for that purpose.

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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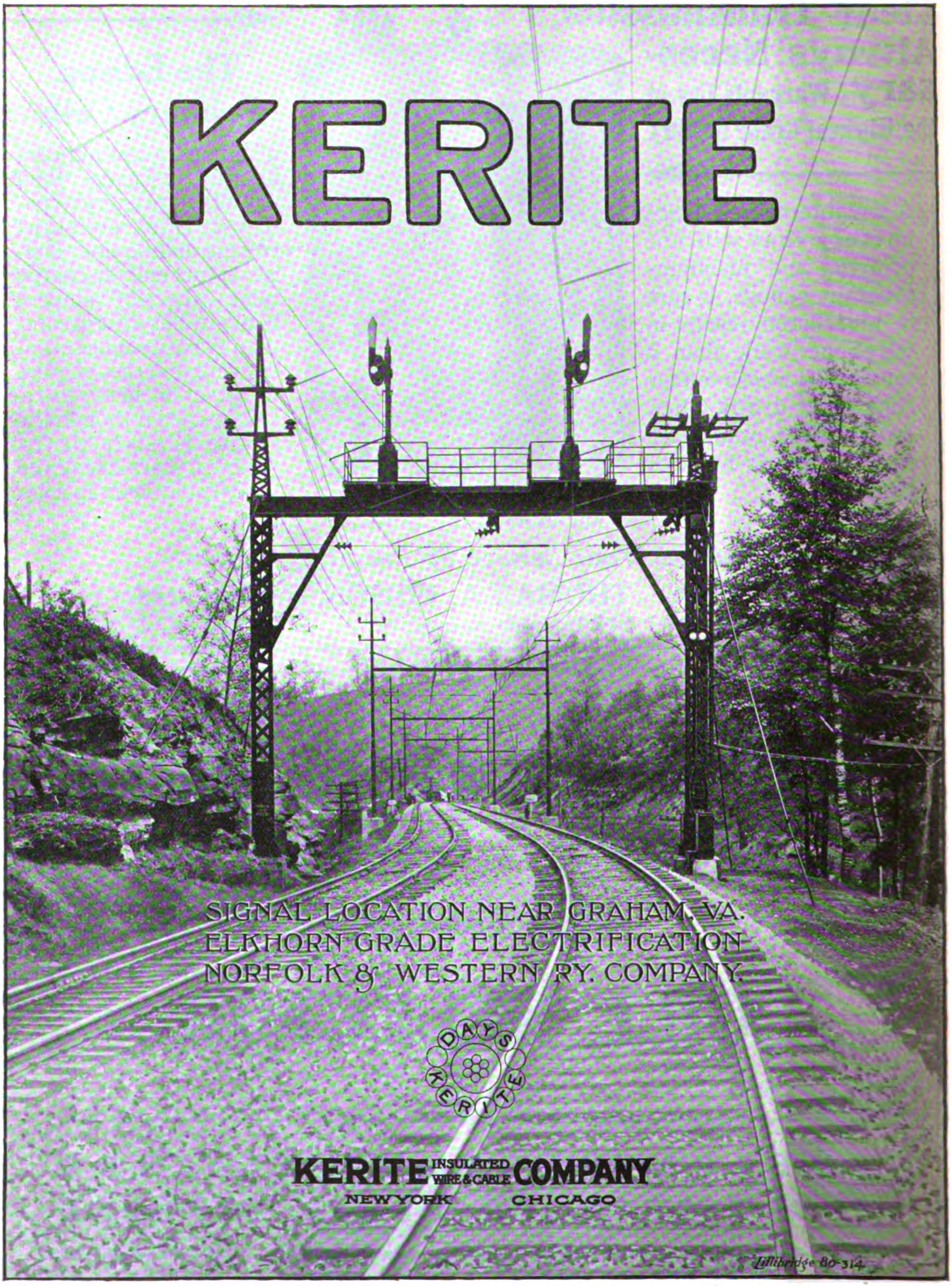

KERITE

SIGNAL LOCATION NEAR GRAHAM, VA.
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NORFOLK & WESTERN RY. COMPANY.

DAYS KERITE

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THE RAILROAD.

Mr. I. D. Hough has been appointed superintendent of telegraph of the El Paso and Southwestern System, with headquarters at El Paso, Tex., vice W. T. Davis, resigned. Mr. Hough was formerly division wire chief of the Western Union Telegraph Company at Dallas, Tex.

Pennsylvania Railroad School of Telegraphy.—The Pennsylvania Railroad has transferred its school of telegraphy from Bedford, Pa., to 1625 Filbert Street, Philadelphia. The school is in charge of Thomas Saddington, manager, and furnishes virtually instruction in railroad telegraphy and train dispatching by means of a miniature railroad equipped with moving trains and signals, duplicating those in actual use.

Convention of Railway Telegraph Superintendents.

The next convention of the Association of Railway Telegraph Superintendents will be held at the Hotel Raleigh, Washington, D. C., September 11, 12 and 13.

Extraordinary matters are engaging the attention of railroad men this summer, but it is expected that there will be a large attendance of members at the meeting. Several matters of importance will be brought before the convention, and the problems that now confront the superintendents in handling the extraordinary business resulting from the traffic pressure with which the railroads are subjected will be thoroughly discussed. Some important papers are promised and the meeting will be profitable in every respect.

There has been some talk of postponing the meeting and having in its stead a division meeting in Chicago in November. In view of President Wilson's expressions on the subject, some of the members think that the annual meeting should take place in Washington as scheduled. Mr. W. L. Connelly, Gibson, Ind., is secretary of the association.

Guiding Trains by Telephone.

In 1850, the telegraph lines, which up to that time had been used only for the carrying of commercial messages, inspired Superintendent Charles Minot of the Erie Railroad with the idea which led to the development of the telegraph dispatching system. After a year of successful experimenting on the Erie, a systematic attempt was made to telegraph train orders to trainmen and conductors from a central point, and from that time until the latter part of 1907, practically all train movements were directed by means of the telegraph.

The introduction of the telephone into the world of business, says the *Western Electric News*, resulted in its speedy recognition as an indispensable asset in the successful economic and efficient conduct of both large and small business undertakings. There was, however, one essential thing lacking, without which the maximum benefits obtainable in a commercial telephone system could not be secured in connection with the handling of train movements. This one thing was a means of calling, quickly and reliably, any one of a number of way-stations located in a dispatching district or division, without interfering with any other station in that district. The selector was the result.

The telephone train dispatching line is nothing more nor less than a party telephone line extending from the dispatcher's office to the various way-stations on his dispatching division. It consists of a metallic telephone circuit to which certain calling apparatus is connected at the dispatcher's office and an individual selector at each of the way-stations, in addition to the telephone apparatus. The calling apparatus at the dispatcher's office is so arranged that a predetermined number of electrical impulses may be sent out at will to signal any one of the way-stations.

The flexibility of the telephone system also makes it possible to secure additional through telegraph and telephone circuits between terminal points or division headquarters without the expenditure of a single dollar for increasing the outside wire plant. This may be accomplished by simplexing and phantoming the train dispatching circuits.

A simple circuit is a telegraph circuit obtained by connecting repeating coils or retardation coils to the telephone circuit. These coils make it possible to carry on simultaneous telephone and telegraph communication over a single pair of wires without interference.

A phantom circuit is a circuit obtained by connecting repeating or retardation coils to two existing metallic telephone circuits in such a manner that a third through telephone circuit is provided over the two pairs of wires. In this way, three telephone conversations may be carried on at the same time over the two original circuits. Practically every railroad having message or commercial circuits paralleling their train dispatching lines is utilizing these wires to secure an additional circuit by means of the phantom.

In October, 1907, the first successful installation of telephone and selector equipment for train dispatching was completed on the lines of the New York Central. This was closely followed by a number of installations on the Chicago, Burlington & Quincy, where it was proved, to the satisfaction of officials of other roads watching these first service tests, that the telephone and selector combination could be used equally well for single track as for double and multi-track operation.

Out of a total of 285,000 miles of railroad in the United States and Canada, over 95,000 are now equipped for this method of handling train movements. Not only is the telephone and selector equipment used on the train wires, but similar apparatus is used on message wires for the transmission of messages other than those relating to train orders.

A comparison of the telephone and telegraph systems in operation will show many advantages for the former. With the telephone, the dispatcher issues orders verbally, using the same terms and forms as he would with the telegraph, his speed being limited only by the rate at which the operator can copy the messages.

Accuracy in transmitting orders is assured by the practice of having the dispatcher write down the words as they are spoken and checking this record, word for word, as the order is repeated back by the operator who has previously written it down simultaneously with the dispatcher. With the telegraph, the dispatcher writes down the order only when it is repeated by the operator and may not catch the errors in the repeat due to the natural impulse to write down the message as originally sent out by him.

This greater accuracy is directly responsible for the fact that since the telephone has been adopted for directing train movements, not a single accident has resulted from its use. The ease and speed with which the dispatcher can handle his work, is a further guard against accidents. There is more time to lay out work and plan meeting points, thus relieving the dispatcher of the mental strain engendered by trying to keep things moving and the almost continued strain of operating the telegraph key. This physical strain has, in the past, been a prolific source of wrecks and other traffic disturbances.

The use of the telephone is not limited to the dispatchers and station operators. Portable telephones are supplied to crews of passenger, freight, and wreck trains. They put the crew in immediate touch with headquarters in case of a breakdown or other accident occurring between stations. With the telegraph, it is necessary to reach the nearest telegraph office. The portable telephone has proved a great aid in the work of construction and bridge gangs.

As a result, the use of portable and siding telephones in connection with the regular dispatcher and way-station telephone apparatus has been a great factor in increasing the operating speed of the railroads that have adopted the telephone method for controlling train movements.

Selectively operated semaphores have also been installed by a number of railroads. The semaphore arms are operated through a local circuit which is energized by a selector connected to the train wire. An answer-back signal automatically notifies the dispatcher that the semaphore has been operated. The selector and telephone apparatus mounted in a weatherproof compartment in the body of the semaphore mast enables the dispatcher to set the semaphore against a train and have the conductor telephone for orders.

There are now about 135 railroad systems in the United States and Canada that have adopted the telephone method of dispatching trains.

Convention of Train Dispatchers.

The thirty-ninth annual convention of the Train Dispatchers' Association of America was held in Fresno, Cal., during the week of June 19. Mr. Hugh McPhee, district commercial superintendent of the Western Union Telegraph Company at Los Angeles, Cal., who was at one time in his telegraph career a train dispatcher, made an address on his company's welfare work. "Employes have an eight-hour day," he said, "based on twenty-six days in a month, and a vacation of a week to those in service one year and two weeks to those in service two years or more. Men are relieved of Sunday work in all departments after 1 p. m. wherever possible. The company has found it more economical and productive of more efficiency to keep its employes well by shortening hours of work and granting other privileges."

The following officers were elected: President, Frank N. McPhee, of Bakersfield, Cal.; vice-president, L. Rice, of Greensboro, N. C. J. F. Mackie is secretary of the association. Next year's convention will be held in Grand Rapids, Mich., June 18.

Convention of Municipal Electricians.

The annual convention of the International Association of Municipal Electricians will be held at Niagara Falls, N. Y., September 11 to 14, both inclusive. The committee is now actively engaged in securing good papers and topics for presentation and discussion at the convention.

Serial Building Loan and Savings Institution.

Following is the statement of the Serial Building Loan and Savings Institution, issued June 1:

ASSETS.	
Cash on hand	$34,058.64
Mortgages	1,115,733.65
Share loans	21,740.00
Real Estate	37,896.33
Shares of Land Bank	10,000.00
Advances	8,099.81
U. S. Bonds	200,00
	$1,227,728.43

LIABILITIES.	
Members' installments	$190,485.47
Savings	498,364.66
Income Certificates	362,997.88
Juvenile savings	1,813.54
Land Bank collateral loans	50,000.00
Due on incomplete loans	50,194.71
Special mortgages	3,500.00
Undivided earnings	43,671.38
Mortgage payments	23,532.79
National Defense Savings Shares	3,168.00
	$1,227,728.43

This institution is incorporated under the banking laws of New York, and is a member of the Land Bank of the State of New York. Mr. Edwin F. Howell, 195 Broadway, New York, is secretary.

During the past month several loans have been made to telegraph people to enable them to purchase their own homes on which they will pay a moderate sum each month for twelve years, when they will become the owners of the property.

OBITUARY

Daniel J. McNamara, electrician for the Newark District Telegraph Company, Newark, N. J., died in that city July 6.

Oscar L. Perry, aged sixty-seven years, for over forty years manager of the Western Union Telegraph Company at Fort Wayne, Ind., died in that city, June 25. He retired from active service four years ago.

Telegraphers for War Service.

There has been a great deal of confusion and misunderstanding as to just how telegraphers can best serve the country and where. The following information on these points is reliable:

The most natural place for any telegrapher, in any army, is in the signal corps. Many who have enlisted have been assigned (during past years, and more recently) to other branches and have had to do uncongenial work, while their real talent was lost to the branch that needed them most, and would have given them the greatest opportunity.

The signal corps can use, right now, every able-bodied telegrapher in the United States who is in good health and not the sole support of dependents. Telegraphers can utilize their ability in telegraph work, in a non-combatant, mounted service, where the pay is good and the opportunity for advancement better than in any other part of the service.

The signal corps is known as the "eyes and ears," and the "nerves" of the army. It is responsible for the establishment and maintenance of lines of communication between the front and all points in the rear. No telegraph expert has yet been asked to enlist under the grade of corporal, which pays $36.00 per month—and this means that amount above all necessary expenses.

Telegraphers residing in the Eastern Division, composed of New York, Pennsylvania, New Jersey, Maryland and Delaware, should apply to Major Henry G. Opdycke, Army Building, 39 Whitehall St., New York City.

Those in other army districts may apply to Department headquarters at Boston, Charleston, Chicago, etc., etc.

INDUSTRIAL.

Morse-Phillips High-Speed Telegraph.

Mr. Walter P. Phillips has closed a contract with Horace G. Martin to manufacture an unlimited number of sets of instruments composing the Morse-Phillips high-speed telegraph. Mr. Phillips purposes to supply the operators when desired to work his system and he would be glad to hear from any of the men who have been associated with him in the past in any of his various enterprises and from any others, with a view to making such of them as he may require propositions that will be sufficiently tempting to bring back into their legitimate sphere those who have strayed into other fields and who prefer to do telegraphic work to any other, provided the rate of compensation is satisfactory.

The widely used and extremely ingenious Vibroplex which bears Mr. Martin's name was invented while he was doing secretarial work for Mr. Phillips in the office of the American Graphophone Company at Bridgeport. He was one of the brilliant members of the force that was released in 1897 by the amalgamation of the former United Press with the Associated Press and was one of the fastest and best senders ever in the press service. His typewriting and penmanship were accomplishments that were generally admired even when he was somewhere between ten and fourteen years of age. He took the Associated Press report at Atlanta while yet a youth.

The J.-C. Repeater.

The Jester-Cooper Company, Houston, Tex., announces that its repeater is meeting with a widely extending use and is giving great satisfaction. Among the new customers who are using this repeater may be mentioned: United States War Department; Postal Telegraph-Cable Company of Texas; Pennsylvania Railroad (East and West of Pittsburgh); Seaboard Air Line; Cleveland, Cincinnati, Chicago and St. Louis Railway; New Orleans, Mobile and Chicago Railroad; Gulf Pipe Line Company; Atlanta and West Point Railroad; Western Electric Company; Southern Pacific Railroad Company of Mexico; Baltimore and Ohio Railroad; New York Central Railroad; Canadian Government Railways; Virginian Railroad; Missouri, Kansas and Texas Railway; Panama Canal; New York, New Haven and Hartford Railroad; Louisville and Nashville; North American Telegraph Company; Nashville, Chattanooga and St. Louis Railroad; Grand Trunk Railroad System; The Texas Company; Pioneer Telephone and Telegraph Company; Missouri Pacific Railroad; Northwestern Telephone and Telegraph Company; Cincinnati, New Orleans and Texas Pacific Railroad; Illinois Central Railroad; Spokane, Portland and Seattle Railway.

This repeater is a direct point repeater and requires no local battery. It is easily and quickly installed and is economical in maintenance and efficient in operation.

Diaphragm Sounder.

The diaphragm sounder manufactured by the Railways Labor-Saving Device Company, Davenport, Iowa, is one of the latest developments in telegraphy. It is an invention arising from a necessity, and the necessity in this case was the elimination of the local battery, on account of the expense and labor in taking care of it. This device gives the noise effect of a sounder by magnifying the noise of the relay contact points, and gives efficient service. It is built strongly and withstands hard usage and abuse, and there is nothing to get out of order. When the relay is adjusted the sounder is adjusted. It is specially useful in bad weather, because it will respond faithfully to the fine adjustment of the relay.

THE GILL SELECTOR.—"How to Clean and Oil a Gill Selector" is the title of a neat pamphlet just issued and now being distributed by the Hall Switch and Signal Company, New York. It is very clearly illustrated and the author is Mr. J. A. Ritter, assistant general manager of the company. This matter was published in TELEGRAPH AND TELEPHONE AGE, May 1 and May 16. Copies of the pamphlet may be obtained on application at the company's office.

Mr. W. I. Capen, vice-president, Postal Telegraph-Cable Company, New York, writes: "It is with pleasure that I send you my check for another year's subscription to your excellent publication."

A Lively Septuagenarian.

"We have with us today"—or at least we did have a few days ago—the familiar figure of Walter P. Phillips, formerly in charge of the Graphophone Company's printing department, says the *Tonearm.* Fresh from a vacation trip to the balmy climes of Virginia, the east coast and Florida, and a swing through the middle west, Mr. Phillips returned to Bridgeport much improved in health and strength and he promptly visited the West Plant to renew old acquaintances. And what was a more natural sight than his characteristic personage moving jauntily through the factory as it did in years past; a little grayer, perhaps, but none the less keen and interesting.

On his extensive tour about the country, Mr. Phillips, famous in the telegraphic and newspaper world, was greeted with open arms, banqueted and "written up" by every leading newspaper, while camera men jockeyed for vantage positions to "snap" him for Sunday editions. Mr. Phillips has never lost his interest in the magic click of the telegraph instrument and he is busily engaged trying out inventions and improvements in the working of wires and machines. One of his latest achievements is the teaching of telegraphy by the use of lessons on graphophone records.

"Probably never before in the history of the country," said Mr. Phillips, "has there been such a dearth of first class telegraphers. The United States Government needs them, the business world needs them, and it is part of my plan to provide them."

The present situation, he added, recalled the words of Abraham Lincoln during the Civil War.

"Young man," said President Lincoln during a conversation with Jesse Bunnell, in 1862, "Young man, I would give a thousand dollars if I had learned to do that when I was young. The ability to read those signals is a never ending mystery to me."

In an article on "The Telegraph in New England," Mr. Phillips says:

"Become a first class operator, if it takes ten years of your life to compass it. Absorb all you can learn about electrical matters. Read all you can and above all sit down occasionaly and think. The man who gets on in the world is he who thinks. * * * * The one fundamental principle that must underlie every worthy achievement is the ability, natural or acquired, not only to absorb information, but to mentally digest it."

Mr. Phillips had everything good to say of the South and its people, except that some of them needed instruction as to the proper method of cooking baked beans. He left Bridgeport to spend the summer months at Oak Bluffs, Mass.

Thirty-fifth Anniversary Greetings.

BY J. B. DILLON, LITTLE ROCK, ARK.

Greetings, Congratulations. I cannot let pass the thirty-fifth anniversay of the AGE without extending felicitous greetings and saying a few words to the friend of the telegraph world. I have been a subscriber to the AGE since a mere boy and during all that time I cannot recall a single statement therein that was not intended either for an intellectual uplift, social guidance, or a little joviality, but never any harmful or pernicious suggestions. There are many chief operators, wire chefs, etc., who have made good and they can truthfully testify that the AGE was their alma mater. It has been only a few years since the telegraph company has distributed its well written specifications covering the technical side of the business, but the AGE has printed helpful articles, covering every department of the telegraph, for thirty-five years and even unto this day with the sterling specifications given away by the telegraph company, social articles printed in the *News*, the AGE twice monthly sends out pages that cover all sides of the telegraph and telephone business, technically and socially. Regardless of all that the specifications and the *News* accomplishes, I say in all honesty that any telegraph man that does not subscribe for the tried and true trade journal, the AGE, is missing an intellectual treat. I sincerely trust that you may reap the reward that is justly due you, and that is, that every telegraph man may subscribe for and read the AGE. If that is done they will be sure to say that the two dollars per year spent have brought them returns a hundred fold.

A New Primary Battery.

A new primary battery has been brought out by Mr. J. W. Warr, of St. Helens, England. From the description of this battery published in the *Electrical Review* of London we gathered the following facts: It is made in three sizes, the No. 1 size being 1⅝ inches in diameter. It is a modification of the Leclanché cell, the active material and depolarizer being packed in a dry state under heavy pressure round the central electrode, with a perforated electrode outside. The cell has a very low internal resistance and high capacity. To make the cell active it is only necessary to stand it in a glass or earthenware jar and add water up to one-quarter inch from the black varnish round the top. Within a few minutes the cell is ready for use, and after a few hours the short-circuit current will be between twelve and sixteen amperes.

The active material, depolarizer and zinc have been proportioned so that exhaustion of all three is nearly simultaneous; but if there is further life in the zinc, the cell can be revived by standing it in a solution of sal-ammoniac. There is no crystallization on the zinc of a cell that has been in use many months.

The e.m.f. is 1.5 volts. The same principle is adopted for bichromate cells (over two volts), Daniell cell ('9 volt), and Lalande (1'4 volts).

After the cell has been lifted out of water, in a few minutes it will be found to be inactive; on the other hand, if it comes in contact with water it will become active.

Another type of cell is being made to be used in place of the dry cell. After immersing in water, the cell will hold sufficient moisture to keep it active over long periods, and this can be repeated until the cell is exhausted.

Crystallization of Lead Cable Sheaths.

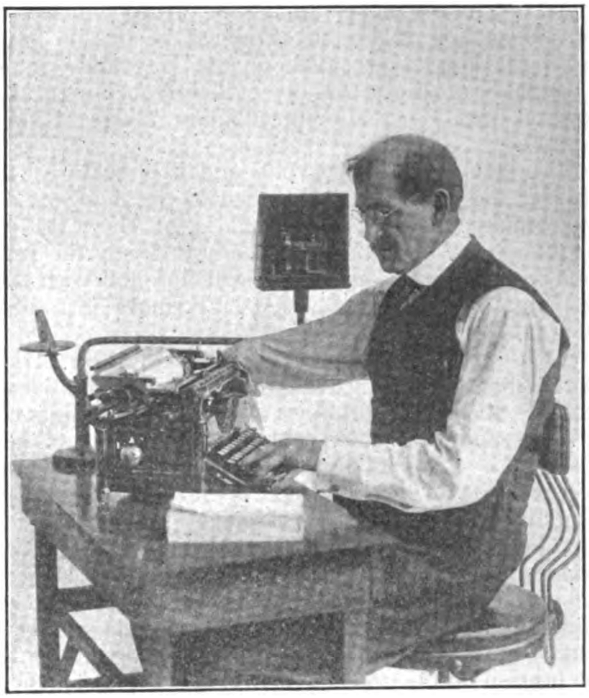
BY L. C. EDDY, JR., BARRINGTON, R. I.

Crystallization of the sheath of lead cables caused by the vibration of bridge structures has necessitated cable removal or replacement in many cases. At places where much vibration occurs, but where it is not feasible to remove the cable or use underground or submarine construction, it is highly probable that methods of support employing some "shock absorber" principle will continue to be used. The present practice, however, can be much improved upon by fastening a single suspension strand to its end supports by means of clamps designed with a shock absorber attachment. Only two of these clamps are necessary for each ordinary span, because cable hangers may be used for attaching the cable to the strand. The use of double steel strand and extra clamps for attaching it to poles, etc., can thus be avoided, and a more sightly and less expensive support provided for places where much vibration occurs. Experience has demonstrated that a small percentage of antimony will harden lead when alloyed with it so that the latter can withstand harder knocks. The alloy is crystalline, however, and it is claimed that antimony subjects lead to rapid corrosion by water. Tin is alloyed with lead to harden and strengthen the sheaths of cables of large diameter, but it does not alloy very uniformly with lead and has a tendency to segregate and develop brittle sections if much tin is used. Experience has shown that lead cable sheaths and, in fact, all metals, crystallize as a result of slow heating or cooling as well as vibration. In view, however, of the superiority in practice of the lead sheath over bitumen or rubber, it is probable that metals will continue to be used for the sheaths of important cables in spite of the fact that they are subject to electrolysis and crystallization.

Maimed Operator Uses a Typewriter.

A remarkable case of a badly maimed operator using a typewriter regularly is that of Melville Fisher, who is one of the operators on the force of the Postal Telegraph-Cable Company, at 253 Broadway, New York. His right arm is severed near the elbow and his left hand is minus two fingers, yet he operates the typewriter with remarkable facility, and receives messages and handles the blanks quite as well as one who has full use of these members. The injuries were the result of being caught by a moving freight train in Mifflintown, Pa., when Mr. Fisher was only five years of age.

Mr. Fisher was born in Mifflintown, May 28, 1858, and learned telegraphy on a tape recorder in the early spring of 1875. In May of the same year he became an operator and later entered the service of the Pennsylvania Railroad, pulling block signals. He was train dispatcher on the Union Pacific Railroad at Denver in 1881 and served in the same capacity on other western railroads until 1884, when he went to Mexico, Central and South America, where he remained about six years. He returned to the United States in 1892 and re-entered the commercial telegraph service, using at that time an old Caligraph on the wires of the Associated Press and the old United Press. In the fall of 1910 Mr. Fisher received ninety-eight messages and cables from Birmingham in one hour. At another time he sent by hand from Washington three thousand words, spelled out, immediately after the sinking of the "Maine" in Havana harbor. He still retains his sending grip, notwithstanding his physical handicap.



MELVILLE FISHER.

Jones' Telegraph Information and Diagrams Enlarged.—The latest edition of Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students, by W. H. Jones, now being sold, includes as an appendix a full description of the Western Union multiplex system. This new matter brings the book up to date, and no telegrapher who has his own welfare at heart can afford to be without a copy of this valuable work on the American telegraph. The price is $2.00 per copy. Send orders to Telegraph and Telephone Age, J. B. Taltavall, publisher, 253 Broadway, New York.

Mr. G. S. Mathews, who has acted as one of our Birmingham, Ala., agents for the past three years, in severing his relations with this paper to take up governmental work writes: "I appreciate your interest in me, and I assure you that you have been a big help in qualifying me for the commission that I am slated for, through the Age and the books that I have purchased from you. The Age started the seed of ambition along these lines and also suggested the proper procedure, and I will be glad to boost the Telegraph and Telephone Age anywhere and everywhere that I have the opportunity to do so."

MR. JEFF W. HAYES' DEPARTMENT.

The Pleiades Club.

CHAPTER XVII.

In most every western city in the United States there exists a Pennsylvanian Society to which any genteel person is eligible provided he or she hails from the classic precincts of the Keystone State, the members of the society evidently being of the opinion that "Once a Pennsylvanian, always a gentleman."

The love of state is strong and it is beautiful to observe the consideration shown to the denizens of the Smoky City by the dwellers of the City of Brotherly Love, and also to see how freely the former citizens of the oil region will hob-nob with the residents of the more favored Harrisburg, Stroudsburg and Erie.

Such is the condition of affairs on the terrestrial planet during life and it is not to be wondered at that the feeling would exist after the inhabitants of Pennsylvania had taken a long flight to the planet Mars.

It was the latter part of the month of June, 1917, that Jim McKinstry, Dan Francis and George W. Baxter, all formerly of Erie; Mark Luce, Ed M. Boynton, recently from the oil section; Peter McKeever, from Pittsburgh, and some of the former Philadelphia boys met and talked over the proposition of having a good old-fashioned Fourth of July celebration on the occasion of the next Independence Day.

A number of gentlemen dropped in on the meeting from Pennsylvania, many of whom had acquired national fame and whose names are household words still on earth.

Telegraphers' Tabernacle, on the planet Mars, was to be the place where the happy event was to take place and the usual bulletin written by a wireless wand on heaven's bright empyrean gave notice to all of the coming event.

"I wonder how these Pennsylvanians would like to have a visit from the Chicago delegation, ejaculated Ed. Whitford, "we have quite a formidable crowd to introduce."

A cordial invitation was extended the Chicago delegation and any other members of the craft who wanted to come, and preparations for the entertainment were immediately begun.

Wednesday, July 4, 1917, arrived and the grounds around Telegraphers' Tabernacle, on the planet Mars, were the scene of much merriment, the badges of the Keystone State being in evidence everywhere.

It was not what the people on Mother Earth would term a "sane" Fourth, as there was a big display of firecrackers and the like, the wish having been expressed that the occasion would be one of the "old-fashioned" kind. Conditions were changed from those on the terrestrial planet, there being nothing of a combustible or inflammatory character on Mars which might invite a conflagration.

A brass band was heard in the distance playing that old song, "We are Coming, Father Abraham, Six Hundred Thousand More," and immediately automobiles containing the Chicago delegation began to arrive.

Among them were the following: Frank M. and Newt Crittendon, Wm. Foley, N. L. Boydston, C. H. Kelly, J. E. Zeublin, A. C. Thomas, John Boughan, P. A. Rowe, Fred Swain, W. W. Wells, J. C. Delong, A. J. Long, John D. Walker, T. P. Dudley, F. S. Kent, S. O. Bracken, Wm. Wallace, Jr., Al Baker, W. C. Ramsdell, Col. J. J. S. Wilson, W. Chapman, S. C. Mason, J. C. Springer, M. C. Bristol, C. H. Summers, G. W. Fulton, Francis W. Jones, H. C. Maynard, E. S. Patton, W. A. Leary, John A. Strong, Luke Fisher, H. G. McGill, Billy McMillen, C. M. Roebuck, Henry Tatge, J. DeWitt Congdon, Harry S. Converse, Frank W. Farley, Jeff Prentice, Earl Rudd, C. H. Haskins, C. W. Gearhart and many others, including a large sprinkling of ladies.

Good natured chaffing was carried on, Charlie Roebuck being asked what was done with that undistributed $300,000,000 his firm had in reserve.

"Oh, we bought Liberty bonds with that money," came the immediate and patriotic reply.

Among other pieces played by the bands were, "We'll Rally Round the Flag, Boys, We'll Rally Once Again"; "Tramp, Tramp, Tramp, the Boys are Marching"; "Columbia, the Gem of the Ocean"; "America"; "Dixie Land," and such darky songs as "Darkies Have You Seen the Massa, with the Moustache on His Face, Walking Down the Road this Morning, Like He's Gwine to Leeb the Place?"

The Tabernacle was visited during the day by Generals Grant, Sherman, McClellan, Sheridan, Franz Siegel, G. H. Thomas, Robert E. Lee, Stonewall Jackson and many others, including all the Presidents back to George Washington's time.

Songs were sung, speeches made, music indulged in and a most enjoyable and entertaining programme was given.

The Philadelphia and Pittsburgh committees were unremitting in their efforts and the Fourth of July, 1917, passed into history on the planet Mars with pleasant memories and a strong feeling of meeting again and often.

Binghamton Without a "P."

For many years Dan Holton was the happy boniface of the Holton House, in Portland, Ore., and the fame of his hostelry was wide and far. Mr. Holton was a New Yorker by birth, hailing from Binghamton, where, at the time of my story, he had an aged mother living.

Although he might be a little dilatory in writing letters, the worthy hotel keeper never neglected to send $100 each month to his mother, which he did by the money transfer system conducted by the telegraph company.

There had recently been a change of managers in the Portland office, and young Jack Hamlin was the new appointee.

"I say, young fellow," said Dan Holton addressing Hamlin, as he entered the office, "I want to send my mother $100 by telegraph, so give me one of your money order forms.

Jack smilingly handed out the required blank, which Holton proceeded to fill out.

Hamlin read the order for the payment of $100 to Mrs. Rachel Holton, address known, Binghamton, N. Y.

"I will just insert the letter "p" in the destination and the order will be complete and correct," said the manager, as he quickly took his pencil and made the supposed correction.

"Yes, but I want to send this money to Binghamton, without a 'p' interposed Holton.

"That's all right," patronizingly replied Hamlin, but we will send it to Binghampton, with a'p' as that is the proper way to spell it."

Humorous taunts passed between customer and manager, Holton backing up his declaration by putting up a $20 gold piece, which was immediately covered by Hamlin.

The company's tariff book was consulted as sufficient authority, which, much to Hamlin's chagrin, spelled it "Binghamton" without a "p".

The generous hotel keeper, however, refused to take the $20 declaring it "too easy" money and he was glad to donate such a small amount to teach the too impetuous manager a useful lesson.

Twenty years later, Daniel Holton met with financial difficulties and returned to his old home where his mother still lived.

His surprise was great, when, one day his mother handed him a bank book with his name on it which showed he had a deposit over $20,000, the fruit of twenty years of being a monthly patron to the money transfer system.

It was just another case of "Bread cast upon the waters."

"I did not need the money, Dannie," said the good old mother, "and I thought sometime you might."

Chicago Western Union.

Frank Abbott, an oldtimer of the Chicago office, died recently.

We found Martin J. Tully, the chief delivery clerk of the Western Union Chicago office, in a soliloquizing mood the other day as he rehearsed the names and some of the doings of former managers and notables of the Chicago office.

You remember Billy Frazier, former chief of the delivery department of this office, don't you? He was as widely known as was "Clark, New York," except that Billy was a live member, and "Clark" merely a fictitious character. Billy passed on long ago and should be a valued member of your Pleiades Club.

I came to Chicago in 1879 and soon after entered the Western Union service as messenger. George W. Felton was manager and a good man. His successors in rotation were the following: E. M. Mulford, J. C. Smith, F. V. Moffatt, John Fitzpatrick, Lorin J. Mink. The manager was in charge of the operating room as well as the commercial end.

The chief operators in succession were Jerry Mereness, W. J. Lloyd, W. R. Holligan, L. K. Whitcomb, A. B. Cowan, Chas. H. Finley, Evan T. Jones.

Other prominent employes were: Charles Catlin, cashier; Henry Behl, paymaster; Ed. Bell, assistant cashier; Robert W. Chapman, chief bookkeeper, George B. Simpson, assistant chief bookkeeper; A. C. Gibbs, now chief bookkeeper in New York; Samuel Spencer, chief collector; A. L. Wellington, now chief clerk, Detroit, Mich.; E. Boening, superintendent, Detroit; John H. Ray, chief night delivery clerk; Henry C. Tobey, settlement delivery clerk; John M. Becker, Thos. Gorman, assistant delivery clerk,; Frank Michaels, now assistant cashier, Union Trust Co.; Astie Carlsom, now in New York.

Following are the names of some since deceased: Ed. Bell, John H. Ray, Henry C. Tobey, John M. Becker and Thomas Gorman.

E. J. Murphy of the office of George E. Palmer, chief operator, New York, is now with Mr. J. P. Edwards, division traffic superintendent, and connected with the telephone service in this office.

H. C. Chace, superintendent of telegraph, Atchison, Topeka and Santa Fe Railroad, and formerly division traffic superintendent in San Francisco, paid Chicago a visit recently and called upon a number of his old friends, including General Manager C. H. Gaunt.

Patriotism is at a high pitch in this office and many will say "goodby" to their colleagues when the time comes to march onward.

John R. Magill, the genial oldtimer so well known in St. Louis and Kansas City, back in the '70's, is on the night force of this office. Jack is exceedingly well. Mrs. J. R. Magill also works the same hours as does her husband.

Chicago Postal.

A new sixty-unit concentration cabinet has been installed in the main office to take care of the increased way-wire traffic. There are now two way-wire cabinets in service. The installation was under the direction of A. C. Johnson of the operating room.

J. D. Murphy is now in charge of the city line traffic, vice W. M. McCreary, transferred to the quad department. Operator H. W. Honic has been promoted to traffic chief in the North American division, vice J. E. McNulty, transferred to the Eastern division.

Chief W. G. Washburn has been transferred to the quad department.

Mrs. Church, our timekeeper, has returned to work. She has been undergoing treatment for her eyes.

A. C. Johnson, equipment chief, has been promoted to assist W. L. Simpson in the electrical engineer's office. W. H. Steels takes over Mr. Johnson's duties in the operating room. John Nash has been promoted to the East board, vice Steels.

Mrs. George Merritt, wife of operator George Merritt, died recently.

Frank Schubert, Philadelphia bonus operator, mourns the death of his father.

General traffic chief J. J. Harrington spent the Fourth visiting relatives in Oshkosh, Wis.

LETTERS FROM OUR AGENTS.

New York Western Union.

S. B. Haig, division traffic superintendent, who is president of the Western Union Educational Society, announced that on account of the pressure of business and other conditions the lecture of Hobart Mason, circuit layout and routing engineer, on July 11 completed the lecture course for the season. The talks will be resumed in the fall. Mr. Mason is an authority on circuit layouts and routing and has been in charge of the gigantic task of charting the wire facilities of the company, which amount to more than one million miles of wire. His lecture was greatly appreciated by those present.

Martin Durivan, supervisor of this office, has gone to Long Branch as has been his custom for almost forty years to act as chief operator during the summer season. The manager of the Long Branch office is P. J. Casey, one of the veterans of the telegraph in the East. Mr. Casey is well and favorably known to more prominent people than almost any other telegraph man.

Among recent assignments to summer offices are: Miss Maude Staples to the Waumbek Hotel, Jefferson, N. H., and C. H. Sniffin to the West End Long Branch office.

Among recent main office visitors were Joseph Marshall, wire chief at Savannah, Ga., and E. J. Murphy, division telephone supervisor, Western Division, Chicago.

R. H. Place, formerly of the statistical department of this office, has returned for a short furlough from the front in France, where he was engaged in driving a Red Cross ambulance. Mr. Place contemplates returning to France with the American troops.

E. D. Pitt, of the office of Mr. S. B. Haig, division traffic superintendent, has been elected secretary of the Western Union Bowling Association, vice First Lieut. J. A. Hart, who has joined the Signal Officers' Reserve Corps.

The New York Telegraphers' Aid Society announces that claims for sick benefits will only be allowed from the date notice is received by the recording secretary, in accordance with the amendment to the by-laws, which became effective July 1.

New Book on Telegraphy.

The third edition of "Telegraphy," by T. E. Herbert, of London, was recently issued. This work is a detailed exposition of the telegraph system of the British Post Office, and has been thoroughly revised and enlarged, containing now 985 pages and 630 illustrations.

This is a valuable book for the American telegraph engineer, because it not only describes the English telegraph systems but other systems which are of direct interest to American practice. The treatment of the various subjects is carried out in a masterly style, and, altogether, the book forms a valuable work of reference, and for study as well.

The terminology in many instances sounds peculiar because it is English, but it is self-suggestive, so there need be no difficulty in understanding the meaning of the terms. "Forked repeater," and "Forking wires," for instance, cannot be taken for anything else other than branch repeater and branching wires.

The price of this book is $4.00 and copies may be obtained of Telegraph and Telephone Age, 253 Broadway, New York.

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HE NEEDS YOU

There is a greater demand now for trained electrical workers than ever before. The Army and Navy and Wireless need such men. They must know how, and they must have initiative if left to their own resources. This is no time to experiment; what the government needs is trained help for its electrical work. Young men who would like to enter the government service should take up a course of practical electrical work at the New York Electrical School and qualify themselves for a government position.

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Have you not had a longing for a cozy little home of your own, with the rose bushes and the flower beds in front and the garden in the back and a playground for the kiddies, all on your own land? That's the life and can be had with little cost! See Secretary Howell.

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Telegraph and Telephone Age

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BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, AUGUST 1, 1917.

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Opportunity of Pensioners to do "Their Bit."

When the telegraph companies adopted the policy of retiring their operators and other employes on pension, on account of age, they had no idea that the time would come when they could again utilize the services of these faithful old employes. This time has really come and now those on the retired list, who feel that they are capable of doing a good day's work, have a chance to help the company which has so generously provided for them in their declining years. The telegraph companies, the railroads and broker houses no doubt will be very glad indeed to avail of the opportunity to secure their services in these times of stress, and we urge these people to come forward and offer their assistance and thus do their part in prosecuting the war to a successful conclusion.

First Class Operators Cannot be Made by Machinery.

A lot of nonsense is being published in many daily papers about women entering the telegraph service and the ease and rapidity with which they can become first class operators. They are told (by the newspapers) that their services are needed by the government or that they can take the places in commercial offices made vacant by male operators leaving to enter the government signal service.

No doubt many get the impression that they can become, as the newspapers assert, first class telegraphers in three months, and how many are acting on this false belief it would be hard to say, but it is regrettable that such misleading statements should be published broadcast.

It is well known that it takes anywhere from two years to make a first class operator, and that in three or six months only a beginning can be made. There are exceptions, of course, and in some instances a young person of exceptional ability may reach the rank of first class in perhaps a year's time, but such cases are extremely rare.

Young Women's Christian Associations in some cities are taking up the task of teaching telegraphy to women, and in most cases the teaching is conducted by qualified persons, usually from the telegraph companies, but the fact that the teachers are competent cannot make first class operators out of raw material in three or six months, as has been intimated.

Misunderstandings.

Misunderstanding is the cause of most of the trouble and discordant conditions in the world. Relatives and friends are often estranged and business interests ruined by a misunderstanding.

One great trouble is that most people accept hearsay evidence as truth and allow themselves to be influenced thereby. Another source of misunderstanding is the habit most people have of criticizing and finding fault with their fellow men and allowing their sense of justice to become warped by their hastily formed opinions.

There are a great many mischievous and malicious meddlers in the world who take delight in creating trouble in personal and business relations.

It is a safe plan not to accept the statements of a third person concerning acquaintances and their affairs.

Misunderstandings of this kind can almost without exception be adjusted by the persons concerned coming together in a spirit of fairness and having a mutual understanding. Usually it will be found that the supposed trouble between them had no basis in truth.

Do not believe reports that have any suspicion of falsehood and do not repeat them, because stories, especially false ones, undergo abnormal changes as they pass from mouth to mouth. The human tongue is a dangerous weapon when not bridled.

Operators for Military Service Causes Shortage of Supply.

The government is making such heavy demands for telegraphers all over the country that the situation is assuming a serious aspect. The telegraph companies and the telephone companies are experiencing very large increases of business and it is with difficulty that they can keep up their own supply of working forces, let alone the requirements of the government. Leased wires will probably suffer the greatest inroads in the demand for government operators. There are at least twenty-five hundred leased wire operators and they are the cream of the profession. There are also in the United States 50,000 railroad and 35,000 commercial telegraphers from whom the government can select its quota for military duty.

Approximately 6,000 telegraphers will be taken to secure the required strength of the Signal Corps department of the first military unit of 500,000 men; each succeeding unit of the same size will require 4,000 more. There will be thirty or more training camps throughout the country, each connected with Washington by direct wire, commandeered from the telegraph and telephone companies and manned by government servants. A wire authority estimates that forty per cent. of the leased wire capacity of these companies will be governmentally employed and the present private leased wire service will be curtailed approximately as much.

Chief operators of leased wire houses are conferring with chief operators of telegraph companies over the modus operandi of some coöperative plan for using facilities and men to the best advantage and without excessive wage demands. It is realized that appeals to patriotism are necessary to produce all available telegraph talent and to coördinate it most effectively and economically.

Patriotism runs high in the leased wire field. Already twenty-five per cent. of these operators have volunteered for service in the Signal Corps. In several large offices here more than one-half the telegraph force has enlisted.

No drafting of telegraphers from railroads, industrials or commission houses is expected, but the Western Union and Postal Telegraph-Cable Companies are not out of the woods yet, as they have not responded with their full quota asked for the army and navy, as the American Telephone and Telegraph Company has. The latter has made an exceptionally good showing, contributing from Chicago alone 1,300 linemen and other experts of various sorts.

Telegraph volunteers will be sent in largest numbers to France, but Russia and other parts of Europe will require a good many for railway service, which it is proposed to conduct largely by American methods under supervision of Americans.

Telegraph and Telephone Patents.

ISSUED JULY 3.

1,231,629. Telephone Switchboard. To H. Lowry, New York.

1,231,800. Telephone System. To F. M. Slough, Rochester, N. Y.

1,231,922. Telephone Exchange System. To A. E. Lundell, New York.

1,231,984. Radio Transmission. To H. D. F. Arnold and H. W. Nichols, New York.

1,232,045. Selective Telegraph System and Apparatus. To C. L. Krum and H. L. Krum, Chicago, Ill.

1,232,087. Automatic Telephone Register Sender. To F. N. Reeves and A. E. Lundell, New York.

1,232,224. Telegraph System. To H. P. Clausen, New York.

1,232,250. Semi-automatic Telephone Exchange System. To A. H. Dyson, New York.

1,232,279. Telephone Exchange System. To C. L. Goodrum, New York.

1,232,338. Automatic Telephone Exchange System. To J. W. Lattig and C. L. Goodrum, New York.

1,232,345. Semi-automatic Telephone System. To A. E. Lundell, New York.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on July 26:

American Tel. and Tel. Co	119⅝
Mackay Companies	78½-81½
Mackay Companies, pfd.	64-64½
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2⅝
Western Union	92⅞

PERSONAL.

Mr. H. B. Perham, president of the Order of Railroad Telegraphers, St. Louis, Mo., is a New York City visitor this week.

Mr. Richard O'Brien, the well known oldtime and military telegrapher, of Scranton, Pa., has enrolled himself and eight members of his family as members of the American Red Cross, and made a liberal subscription toward the Red Cross fund.

Charles R. Chase, grandson of Mr. S. L. Robinson, an oldtimer and military telegrapher during the Civil War, has joined the Ambulance Corps and has gone to France, where he will do his share of work in prosecuting the war. All of his ancestors from the Revolutionary days were patriots.

Mr. H. O. Rugh, well known in electrical and railroad circles in Chicago, is now identified with the Kleinschmidt Electric Company, New York, as engineer. These interests have factories in Brooklyn and New York, where Kleinschmidt printers and perforators are being turned out in large numbers.

Mr. F. V. Moffitt, well known in telegraph circles, having been at one time manager of the Chicago and Toledo, Ohio, offices of the Western

Union Telegraph Company, but who retired from active telegraph service four years ago, is now vice-president of the E. B. Carrigan Company, Omaha, Neb., wholesale coal dealers.

MAUDE CLARK HOUGH, wife of I. D. Hough, superintendent of telegraph of the El Paso and Southwestern System, El Paso, Tex., and well known to the telegraph fraternity, has written a touching and cheering poem to Mrs. W. S. Strawbridge, wife of Chief Operator Strawbridge, of the Western Union at Dallas, on the occasion of the enlistment in the Navy of her son, W. J. Strawbridge. The thought of the poem is "Trust."

MR. CHARLES E. THATCHER.—We have received from Mr. Charles E. Thatcher, former manager of the Western Union Telegraph Company's office at San Francisco, and now assistant to the general manager of the East Bay Water Company, Oakland, Cal., a copy of a sprightly paper published by the water company. It is called "Bubbles," and is devoted entirely to the company's interests and to matters pertaining to the personnel of the various offices.

CAPTAIN W. A. KING, Signal Reserve Corps, and chief of the telegraph division, War Department, Washington, D. C., delivered a lecture recently before the officers of the Quartermaster Reserve Corps at Washington, his subject being: "The Use of the Commercial Cable and Telegraph for Army Purposes." Mr. King is a son of Albert King, and a nephew of William C. O'Neal, both United States military telegraphers during the Civil War, at Georgetown, D. C.

SENATOR WILLIAM L. IVES, of New York, the well known oldtime and military telegrapher, who retired from active service several years ago, is in the vicinity of Syracuse, his native heath, where he will spend the summer months. The Senator is well and favorably known to the profession throughout the entire country. He had been identified with the fraternity since 1857 and has held many important positions. He was for eleven years manager of the government telegraph office in the United States Senate at Washington, D. C.

LIEUTENANT-COLONEL LENOIR.—Major B. O. Lenoir, in charge of the Alaska cable and telegraph system, with headquarters at Seattle, Wash., has been promoted to the rank of lieutenant-colonel. Before becoming assistant signal corps head at Seattle he was in charge of the cable steamer "Burnside," and before that was in charge of the signal corps stations in Alaska, with headquarters in Valdez and Cordova. He is fifty-eight years old and a native of Georgia. At the outbreak of the Spanish-American war he was commissioned a first lieutenant and assigned for duty in the signal corps, in which he has remained ever since.

CAPTAIN JOHN A. KICK, of the U. S. Army Signal Corps, the well known telegraph and telephone engineer, is now engaged in organizing the reserve signal corps in sixteen states. In 1892 Captain Kick became an operator on a western railroad and in 1898 he enlisted at the outbreak of the Spanish-American War, serving in Porto Rico and the Philippines. In 1905 he entered the service of the American Telephone and Telegraph Company at Chicago as wire chief and assistant chief operator, and in 1910 was appointed engineer of the telegraph department of the New York Central Lines West. He afterward went with the Western Electric Company as railway sales engineer. Several months ago he received the appointment as captain in the regular army and was assigned to the Signal Corps. He is co-inventor of the Cummings-Kick typewriter telegraph system and the inventor of a high speed selective system for train dispatching.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

MR. EDWARD REYNOLDS, vice-president and general manager, expects to leave on vacation August 6, and will spend the following three weeks on the golf links and automobiling.

VICE-PRESIDENTS Chas. C. Adams and Major C. P. Bruch, will probably leave on vacations about September 1.

MR. E. W. COLLINS, general superintendent, and Mr. J. G. Blake, special agent, Chicago, have returned from a tour of inspection of government training camps and the following offices: Omaha, Council Bluffs, Grand Island, Hastings and Lincoln, Neb.; Sioux City and Des Moines, Iowa. Managers everywhere were found to be enthusiastically "doing their bit" and they expressed their appreciation of this, the first visit of Mr. Blake.

GENERAL SUPERINTENDENT A. B. Richards of San Francisco and Vice-President W. I. Capen of New York are making a trip of inspection in the northwestern states.

MR. H. A. TUTTLE, president and general manager of the North American Telegraph Company, Minneapolis, Minn., accompanied by Mrs. Tuttle, is spending a few weeks at Ilion, N. Y., which is the home of both Mr. and Mrs. Tuttle. Mr. Tuttle will return to Minneapolis via New York in a few days.

MR. V. V. STEVENSON, superintendent at Los Angeles, Cal., is in El Paso, Tex., on government censorship matters.

MR. C. A. RICHARDSON, superintendent, New York, has returned from a trip of inspection to the various offices in his district.

MR. J. F. SKIRROW, associate electrical engineer, New York, is spending his vacation at Asbury Park, N. J.

MR. A. J. EAVES, assistant engineer, New York, has returned from a trip of inspection which took him as far as California.

MR. J. P. O'DONOHUE, division electrical engineer, New York, is back to his desk after his annual vacation.

MANAGERS APPOINTED. — B. A. Gould, at Kearney, Neb.; C. L. Prefontaine, Fond du Lac, Wis.; B. Krasnicky, Michigan City, Ind.; and J. J. Yarnelle, Reed City, Mich.

MR. BENJAMIN F. ROMMELL, for the past ten year manager of this company's office in Kansas City, Mo., and prior to that chief operator, has resigned to enter the brokerage field. Mr. Henry C. Hill, assistant manager, succeeds Mr. Rommell. Upon his last day at the office a number of old friends of Mr. Rommell wished him good luck in his new career, and presented him with a handsome diamond ring. Mr. Hill, the new manager, has been with the Postal in Kansas City more than a quarter of a century. He has been assistant manager for the past six years.

TARIFF CIRCULAR.—This company has issued its regular tariff circular, dated July 1, which brings the tariff and relevant matters up to date.

MR. GEORGE O. KOESTERS, recently appointed manager at Columbus, Ohio, is a native of the Buckeye State, having been born at Cincinnati, February 17, 1884. He began his telegraphic career in that city in 1906, entering the service as a messenger. He advanced through the positions of clerk, operator and branch manager, and has now become manager of the office at the capital city.

W. L. Simpson, Division Electrical Engineer, Postal Telegraph-Cable Company, Chicago.

Mr. W. L. Simpson, whose appointment as division electrical engineer of the Postal Telegraph-Cable Company, Chicago, was briefly noted in our July 16 issue, was born on a farm near Sedalia, Mo., and began his telegraph career as a messenger for the Illinois Central Railroad at Barclay, Ill., in September, 1888. In 1890 he was transferred to Springfield, Ill., where he worked as operator and bill clerk for the Illinois Central for a few years and functioned the multiplicity of duties, ranging from check clerk in the freight house to train dispatcher and even trainmaster. He entered the Postal Company's service August 1, 1893, as operator at Springfield, Ill. While in that office he acted as general handy man—messenger, if need be—telephone, delivery and receiving clerk and operator, and substituting for the manager when the occasion required. In other words, he was always available whenever anything was needed to be done, seeing it and doing it.

W. L. SIMPSON.

From Springfield Mr. Simpson was promoted to be early-chief operator at Denver and from there to the management of the repeater station at La Junta, Col. In June, 1911, he came to Chicago as assistant to the division electrical engineer, which position was held until appointed to the present position.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

MR. NEWCOMB CARLTON, president of the company, left for the Pacific Coast on July 26 on a business and pleasure trip, accompanied by outside business friends. He expects to return to his office about the middle of August. The party will make stops at Salt Lake City, Portland and San Francisco.

MR. J. C. WILLEVER, vice-president in charge of commercial department, started on his vacation last week. He will tour through the New England states by automobile and will be accompanied by his family.

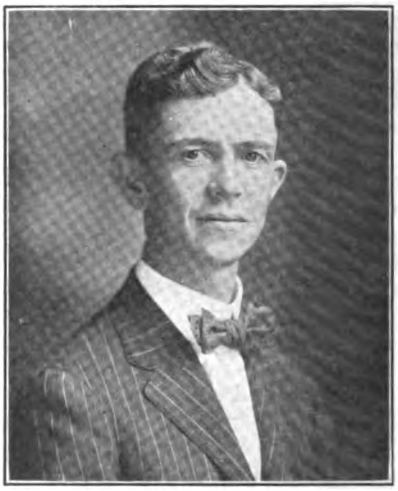
MR. LEWIS DRESDNER, treasurer, will start on August 2 on a trip through the Great Lakes region, to be gone about ten days.

MR. E. F. KELLEY, district commercial manager, Western Union Telegraph Co., gave a lecture before The Forum, Duluth, Minn., on July 18, his subject being "Ocean Cables and Their Importance in the Present War." Mr. Kelley has been invited to give this lecture before several other organizations.

MR. T. D. NEVINS, division traffic engineer of the Gulf Division, Dallas, Tex., has received a commission in the Signal Service and during his absence his position will remain open.

W. T. Davis, District Commercial Superintendent, Omaha, Neb.

Mr. William T. Davis, whose appointment to be district commercial superintendent at Omaha, Neb., as noted in our July 1 issue, was born in Fairmont, W. Va., January 30, 1878. He entered the telegraph service on October 18, 1892, as



W. T. DAVIS.

messenger for the Western Union Telegraph Company. He became operator and finally manager at Fairmont and his next move was to Colorado Springs, Col., as chief operator. Later he went to Durango, Col., as manager and afterwards became cashier in the superintendent's office at Denver. While in the latter city he also filled the positions of printer chief, chief clerk to the division plant superintendent and chief clerk to the general manager and later became superintendent of telegraph of the El Paso and South Western Railroad at El Paso, Tex., which position he held at the time of his recent appointment.

New Western Union Office at Cleveland, Ohio.

The new Western Union office in the Rose Building, Cleveland, Ohio, was cut into service on the night of May 19.

The operating room occupies about half of the fifth floor space of 9,800 square feet and contains operating positions for nearly 200 Morse and multiplex operators. City wires are brought to three eight-wire concentration units in order to expedite prompt handling of branch office business. There are also two sixteen-wire selector concentration units for handling way wire business. The remainder of the fifth floor space accommodates the testing and regulating department, telephone room, Morse and automatic schoolrooms, and the Commercial News Department. The switchboard consists of one loop, one city line and seven main line sections of the pin jack type. The distributing frame for terminating and cross-connecting all wires and the motor generator plant are located back of the switchboard. Equipment for combined time and messenger circuits has been installed. This permits connecting clocks and messenger call boxes to the same circuits.

A system of pickup and delivery belts handle messages between operating tables and the routing center.

Windows on three sides and a ceiling height of fifteen feet afford ample natural light and ventilation. Artificial illumination is provided by standard semi-indirect lighting fixtures.

Space on the fourth floor similar to that on the fifth accommodates the bookkeeping department, district plant office, operators' rest, locker and toilet rooms, and a hospital room.

On the ground floor of the building, with entrance from East Ninth Street, is the new commercial office. A large lobby and customers' counter occupy the front of the space, the delivery department and call circuit board occupy the rear, and working space between counters accommodates about thirty employes. Pneumatic tubes connect the ground floor office with the operating department.

The ceiling height on the ground floor is eighteen feet, and in order to provide sufficient artificial illumination a special type of semi-indirect lighting fixtures, combining efficiency with ornamental appearance, have been installed.

Basement space below the commercial office is used for storage rooms and for messengers' quarters, which include a clubroom, toilets, shower baths and a tailor shop for care of uniforms.

Mr. B. J. Ross is commercial manager of the Cleveland office and Mr. M. A. McGrath is assistant manager. Following are the chief operators, etc.: F. J. Dayman, chief operator; F. L. Hertzer, night chief operator; T. B. Baker, late night chief operator; W. Bligh, assistant chief operator; J. Wissmar, wire chief; W. Gales, night wire chief; C. F. Williams, late night wire chief; A. H. Cassidy, supervisor Morse trunks; F. G. Diebold, supervisor ways; J. T. Hanford, supervisor city lines; C. S. Jones, supervisor automatics; W. A. Ladd, chief automatic attendant; J. F. Traverse, repeater chief; M. Handler, manager Commercial News Department; L. Masterson, assistant chief operator in charge of telephones; V. J. Beaumont, chief clerk. There are 425 employes on the traffic payroll.

THE CABLE.

Deferred Rates to Central America.—The Mexican and the Central and South American Telegraph companies on July 16 began a deferred rate service to Panama and Ecuador at half the regular rate of forty cents a word.

Cable Censorship.—Extension of the cable censorship to all transatlantic messages was formally ordered on July 18 by Secretary Daniels of the Navy under the authority of President Wilson's executive order of April 28. The censorship will apply to press as well as private dispatches.

Alexander E. Hoyt, aged eighty years, who was identified with the Western Union Cable interests at North Sydney, N. S., for fifty years, and who was pensioned two years and a half ago, died at that point July 8. W. H. Hoyt, the well known telegrapher of New York, now living in retirement at Montclair, N. J., is a brother of the deceased.

Student's Guide to Submarine Cable Testing, by H. K. C. Fisher and J. C. H. Darby, fifth edition, is the most recent book published on submarine cable testing. It is very complete and covers simple testing, measurement of copper resistance, capacity and its measurement, tests for breaks, the earth overlap, measurement of the resistance of an earth, and many other subjects pertaining to submarine cable work. A valuable feature of the book is a list of questions and answers, and many diagrams of connections of apparatus. Price $3.50 per copy. For sale by Telegraph and Telephone Age, 253 Broadway, New York.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to July 25 as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable) October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917.

CANADIAN NOTES.

CANADIAN PACIFIC.

Charles L. Hallett, aged fifty-four years, formerly circuit manager at Fort Williams, Ont., but for the past ten years in the insurance business at Winnipeg, Man., died in the latter city on July 7. For many years Mr. Hallett acted as agent for Telegraph and Telephone Age.

John Dee, son of William Dee, district superintendent, government telegraph service, Victoria, B. C., has returned home from Europe incapacitated for future service. He is hale and hearty, and only a slight limp is noticed when he walks. Another son of Mr. Dee is located at the general headquarters of the army in France. He reports that he frequently came across Canadian telegraphers on the various battle fronts.

THE TELEPHONE.

Field Ambulance Purchased.—Chicago Telephone Company employes have subscribed $2,135.01 for the purchase of a field ambulance for use in relief work in France.

A Few Telephone Calls.—During the year 1916 the daily average of telephone calls in New York City was about twenty-nine million four hundred and twenty thousand.

Newark Telephone Company Sold.—The New York Telephone Company has purchased the assets of the Newark (N. J.) Telephone Company, which has been in the hands of a receiver.

Value of Arizona Telephone Lines. — The valuation of telephone lines in Arizona has been fixed by the State Tax Commission at $2,883,687. There are 40,712 miles of telephone wire in the state.

Telephone Mileage and Offices.—The Bell Telephone System in the United States on May 31 owned 20,870,194 miles of wire, compared with 18,905,218 at the same time in the year 1916, and 10,256,068 connected stations, compared with 9,463,800.

Telephone Pioneers' Meeting Postponed.

The executive committee of the Telephone Pioneers of America has decided to postpone the annual and general meeting of this year, pending the development of more favorable conditions.

Distinguished Visitors Talk Across the Continent.

Lord Northcliffe, head of the British Mission, General White of the British Army and other distinguished guests in New York talked over the transcontinental telephone circuit on July 12 to Pittsburgh, Chicago, Omaha, Denver, Salt Lake, Winnemuca, Nev., and San Francisco, then listened to the roaring of breakers at the Golden Gate.

The Central Union Telephone Company to Be Sold at Auction.

Judge Dever, of the Superior Court of Cook County, Chicago, on July 10 entered a decree in the case of the Central Union Telephone Company, ordering that all of the stock of the company held by the American Telephone and Telegraph Company be cancelled and that the Central Union Company be sold at auction.

The Central Union Telephone Company operates in Illinois, outside of Chicago, in Indiana and Ohio.

Making Telephone More Efficient.

In order to keep disturbing sounds out of the ears and to amplify the sound, particularly in the instance of long distance calls, there has recently been introduced a device which can be used with the ordinary telephone instrument, but which is not an attachment, and therefore cannot be objected to by the telephone companies, says the *Scientific American*. This device consists of a sound chamber over which is placed the telephone receiver instead of putting it up to the ear, and two adjustable hearing tubes. Simple means are provided for fitting the tubes to the individual, thus leaving his hands free.

Joints on Telephone Lines.

On telephone junction poles where insulated copper wires are used for jumping the iron wires from one pin to another, the joints are often left unsoldered. This results in every instance in a resistance joint and often causes the subscriber no end of trouble for the service gradually gets weaker as the resistance increases.

Copper to iron connections should never be left unsoldered, for in galvanized wire the chemical action induced by the air sets up a miniature current, seemingly, between the copper and zinc coating, resulting in increasing resistance between the two metals. Soldering alone will check this action.

Telephone Earnings and Expenses.

The earnings report of the American Telephone and Telegraph Company for six months ending June 30 shows the following results:

Earnings:	1916	1917
Dividends	$13,253,106.08	$13,968,644.00
Interest and other revenue from associated companies	6,874,308.74	8,580,213.71
Telephone traffic (net)	4,197,037.32	4,754,480.13
Other sources	859,577.94	1,136,824.41
Total	$25,184,030.08	$28,440,162.25
Expenses:	2,725,155.38	3,672,813.93
Net earnings	$22,458,874.70	$24,767,348.32
Deduct interest	3,287,791.67	5,171,443.22
Balance	$19,171,083.03	$19,595,905.10
Dividends paid	15,425,007.88	15,839,804.64
Balance	$3,746,075.15	$3,756,100.46

The earnings report of the Bell Telephone System in the United States for the five months ending May 31 shows the following results:

	1916	1917
Total operating revenues	$105,500,128	$120,077,825
Total operating expenses	69,144,217	80,875,893
Net operating revenues	$36,355,911	$39,201,932
Surplus earnings	$9,085,145	$8,964,454

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager, and Mr. R. A. Weagant, chief engineer, New York, have returned from a business trip to Washington.

Mr. John Bottomley, vice-president, New York, has been spending a week at his country home on Long Island.

Mr. J. de Jara Almonte, who is taking the cure at Richfield Springs, N. Y., will sail for South America this month.

Mr. C. H. Taylor, chief engineer Transoceanic Division, has returned from Marion, Mass., where extensive construction work is in progress in preparation for the Norwegian service.

Lieutenant O. Boutillion, a wireless expert of the French Post Office Department, who has completed a tour of this country during which he inspected the Marconi high power stations on the Atlantic and Pacific Coasts, is now enroute from New York to Glace Bay and Montreal for inspection of the Canadian high power stations and will submit a report to his Government on the progress of radio science in America.

Wireless Meeting in London.

The annual meeting of the Marconi International Marine Communication Company, Ltd., was held in London recently. Mr. Godfrey Isaacs, who presided, said that in view of the fact that their business was still being conducted under exceptionally unfavorable conditions the figures were satisfactory. Practically the whole of their profits were derived from ships' subsidies, for there was practically nothing doing at the present moment in commercial or private telegrams at sea. Not only had the number of ship telegraph stations been immensely augmented during the war, but there had been also a large addition to the coast stations, which would give far greater facilities for communication with the land than obtained prior to the outbreak of hostilities. They felt justified, having regard to the sound development of the business, to recommend an increased dividend, which they felt confident of being able to at least maintain, notwithstanding the necessity for increasing the capital.

Up to June 30 this year they had already fitted 595 additional ships, making the total number of ships installed, after deducting losses, 1,855, which was by far the biggest rate of increase in the history of the company.

He paid a tribute to the staff. To June 16 they had 3,347 operators and students. Of these, to that date, 333 had been saved from vessels sunk, forty-five were drowned, twenty-nine had been injured, one killed, and nineteen had been taken prisoners of war. A number of instances of splendid heroism were given by the speaker. One man had been torpedoed three times within three months, standing to his post unflinchingly on each occasion. The company had now given him a post on shore, because if his nerves had not suffered they ought to have done so.

New Radio Division for Signal Corps.—A radio division of the office of the chief signal officer has been established to handle radio matters, both for the aviation section and the signal corps proper. Major Nugent H. Slaughter, U. S. R., is designated as officer in charge of this division, which will be located at 1710 Pennsylvania Avenue, Washington, D. C. Captain Charles C. Culver is transferred from the Aircraft Engineering Division to the radio division.

New Book on Wireless Telegraphy.

A practical book on wireless telegraphy has just been issued by the Wireless Press, Inc., bringing the subject up to date. This new work is entitled "Practical Wireless Telegraphy," the author being Elmer E. Bucher, instructing engineer of the Marconi Wireless Telegraph Company of America. It is a complete textbook for students of radio communication in which the author has endeavored to give the non-technical student and the practical telegrapher an understanding of the functioning of present-day commercial wireless telegraph apparatus.

No attempt has been made to treat the subject with rigid scientific accuracy or completeness, the idea being rather to show the student what the apparatus consists of and how it is manipulated.

Each topic is treated separately and completely, furnishing progressive study from first principles to expert practice. Starting with elementary data, it progresses, chapter by chapter, over the entire field of wireless, fundamentals, construction and practical operation.

The 350 illustrations alone, specially drawn, form a complete diagrammatic study and impress upon the reader's mind a pictorial outline of the entire subject. Many of these illustrations reveal details of construction of the newest types of sets and apparatus never before published.

The book is 6 x 9 inches in size, and contains 330 pages and 350 illustrations. It is substantially bound in cloth and the price is $1.50 per copy.

For sale by Telegraph and Telephone Age, J. B. Taltavall, publisher, 253 Broadway, New York.

Mexican Telegraph Re-established.—After a lapse of several years telegraphic communication has been re-established between Mexico City, Mexico, and the State of Yucatan.

The Stock Ticker.*

BY HORACE L. HOTCHKISS.

Electricity for the service of man was not only first utilized in the nineteenth century, but through the various discoveries and mechanisms of Morse, Wheatstone, Edison, Bell, Humstone, Farmer, Calahan, Tesla, Prescott and other famous inventors was made practical and profitable in both commercial and domestic life. In 1867 E. A. Calahan, who had been associated with the American Telegraph Company for many years as a telegraph operator and manager of its electric batteries, conceived the idea of the stock telegraph printing instrument. Mr. Calahan had noticed the congestion of business around the halls of the Stock Exchange, which was largely caused by the brokers and their clerks struggling to secure the latest quotations made on the floor. These were recorded on suitable pads and then carried by hand to the various Wall Street offices. Active brokers and their messengers were at that time often called "pad shovers" in the humorous slang of the day. It occurred to Mr. Calahan that an instrument might be constructed which would record automatically the names of securities and the figures representing quotations or selling prices. The necessity of such an invention was questioned by many of the most experienced bankers and brokers of that period, some of them declaring that they and their customers preferred to have quotations brought to their offices by the "pad shovers," as it gave them an opportunity to send back orders to be executed on the Exchange through this medium of communication.

Mr. Calahan spent several months in perfecting the printing or recording instrument, and succeeded in arranging a transmitter which could operate many instruments from one central office. He had these details completed in the summer of 1867 and a corporation under the general laws of the State of New York, called the "Gold and Stock Telegraph Company," with a capital of $200,000, was organized on September 19, 1867. Messrs. Elisha W. Andrews, William Muir, George B. Field and Horace L. Hotchkiss assisted in its organization and early development. Later, Mr. George B. Field was elected president and the writer of this article secretary and treasurer.

Mr. Robert H. Gallagher, who had charge of the night exchange uptown (which was used by operators during the exciting times of the Civil War), had a large acquaintance with Wall Street brokers and was engaged to secure patrons or subscribers who would contract to pay $6 per week for the quotations. His efforts, in conjunction with those officers of the company, resulted in agreements with a number of the prominent brokers of the Street. The governors of the Stock Exchange granted permission for employes of the company to go on the floor of the Exchange and report the market prices by this new system. In December, 1867, between Christmas and New Year's Day, the first stock quotation instrument was placed in the office of David Groesbeck and Company, where the veteran operator Daniel Drew made his headquarters. The next day an instrument was placed in the office of Work, Davis and Barton, and on the third and fourth days instruments were placed in the offices of Greenleaf, Norris and Company and Lockwood and Company, respectively. These four instruments were delivered in the order of subscription. Before they had been in operation many days the company had on its list of subscribers about one hundred of the prominent bankers and members of the Exchange. When the first instrument began work in the office of David Groesbeck and Company it naturally created a sensation as the quotations made their appearance on the tape. The crowd around it was at least six deep, and the person nearest the instrument called out the prices to the wondering assembly. At that time Mr. William Heath was an active broker; he was tall, thin and exceedingly energetic. It was his custom to run from office to office, supplied with the latest quotations obtainable from the floor of the Exchange. He was generally known as the "American Deer," and now was surprised to find in Groesbeck's office a crowd watching the "ticker." He created much amusement when offering his quotations, and was told he was "too late—we have them all on the tape." It was some months, however, before he thoroughly realized that the machine could outstrip the "American Deer" in the race of quotations, but eventually he had to surrender, and filed his order for one of the company's instruments.

The operation of the earliest stock quotation instruments required the closest attention of Mr. Calahan and his assistants. A source of annoyance to the brokers was the liability of the instruments to get out of "unison" and thus make a jumble of unintelligible letters or figures on the tape. To adjust the instrument back to "unison" required the visit of one of the employes of the company to the office where it was out of order, and, as calls for such service were at that time quite frequent, it often became necessary for the treasurer, superintendent, and even the office boys to respond to them. Later in the history of this enterprise Mr. Henry Van Hoevenberg invented an automatic "unison" adjustment which was attached to the Calahan instrument and corrected this difficulty.

As it was at that time claimed that the stock instruments of the Gold and Stock Telegraph Company would revolutionize the old system of reporting prices, they were naturally placed under the most severe tests of adverse criticisms, not only as to their capacity for responding to the mechanical requirements in producing an accurate and immediate report of the fluctuations of stocks, but also questioning the desirability of such an innovation on the old style of making known the market.

Another difficulty which caused much annoyance to the management of the company, and also the bankers and brokers in their offices at the time of the introduction of this system, was the necessity for a local battery in each office where the instrument was placed. This battery consisted of four glass jars, then known as the carbon battery, supplied with a liquid consisting of proper proportions of sulphuric acid and other chemicals in connection with zinc and carbon. This acid had to be renewed twice a week in the early morning before the commencement of business, and it was carried around in pails to the subscribers' offices. At times serious as well as amusing accidents occurred during the performance of this duty—carpets were spoiled, furniture injured, clothing damaged—and, in fact, at one time it looked as if the sulphurous influences of that "infernal battery" would discourage the use of the instruments. Fortunately, before the whole system was abandoned, Mr. Calahan proved equal to the crisis, and arranged a plan for operating the instruments by means of a large system of batteries placed in a building equipped for that purpose, and thereafter the local battery in the bankers' and brokers' offices was eliminated from the problem.

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*Written in 1905 and published in "The New York Stock Exchange," by E. C. Stedman.

The "gold indicator," which had been inaugurated in the Gold Exchange by S. S. Laws, proved to be of great value, and had anticipated the advent of the stock ticker by several months. Mr. Laws was the vice-president and presiding officer of the Gold Exchange and displayed considerable mechanical ability when he arranged a double-faced gold indicator, one face of which was visible in New Street outside of the Gold Exchange, while the other looked inside and was visible to members on the floor. At that period the premium on gold fluctuated rapidly and highly excited crowds often stood in the street watching this indicator and the varying changes of the market. It was quite the custom to regulate the day's prices of many staple articles of commerce by the opening price of gold at the Gold Exchange. Early each morning merchants assembled on the street to watch for the first figures of the gold indicator and then hastened to their places of business to mark a corresponding value on their merchandise. This condition of affairs on New Street and the multitude of messengers that were kept running to and from the Gold Exchange suggested to Mr. Laws the plan for establishing a system of gold indicators, to be operated by an electric current from the Exchange and set up in the various offices connected therewith, so that every fluctuation of the market could be reported to all subscribers simultaneously.

In August, 1869, the Gold and Stock Telegraph Company purchased from S. S. Laws his patents, inventions, good will and all his interests in the gold indicator for $25,000 in cash and $75,000 of the capital stock of the Gold and Stock Telegraph Company. They also agreed to pay to Mr. Laws $10,000 per annum during the continuance of the premium on gold, and this royalty in fact was paid until January 1, 1879.

At the time of the organization of the Gold and Stock Telegraph Company there were not less than six additional general telegraph companies competing for the business of the bankers and brokers. Nearly every housetop in and about Wall Street was cobwebbed with bare and uninsulated wires. Mr. Calahan felt that it would be impossible to expose his ticker system to the danger of contact with any of these wires and therefore decided that thoroughly insulated wires should be used on the lines of the company. The difference in the cost of construction between perfectly insulated wires and the uninsulated was in the ratio of 40 to 1. The wisdom of his decision was soon proved, as the wires of the company were not disturbed. At that time the only insulated wire that could be secured for the construction of the company's lines was A. G. Day's "Kerite" wire. As it was then a new invention, and the facilities for producing it were very limited, the cost to the company in those early days was equal to eight cents per foot. This same wire at the present time is produced in vast quantities at a small fraction of a cent per foot and of the same standard of reliability.

Before the end of the first year's operations of the company there was a general demand for the stock ticker by members of the Stock Exchange and others interested in the stock market. Requiring additional funds for constructing the lines of the company and placing instruments in service, they found it necessary to increase their capital from $200,000 to $500,000. This was accomplished on May 7, 1868. On September 4, 1869, the capital of the company was increased to $1,000,000, a portion of the increase being needed to purchase the gold indicator system and patents of S. S. Laws.

At the annual meeting of the company on September 7, 1869, the following gentlemen were elected directors: George B. Field, Joseph M. Cook, Tracy R. Edson, D. J. Garth, S. S. Laws, A. F. Roberts and W. B. Clerke.

The growth of the business continued with giant strides and the company soon found other fields of operation. Both the Produce Exchange and the Cotton Exchange adopted the new system of reporting their markets and the financial interests in and about Wall Street became patrons of the "General News Bureau," which was established by the company for reporting over its wires the news of the day and the gossip of the Street appertaining to financial affairs.

In March, 1870, General Marshall Lefferts was elected a director and president of the company, and on October 11, 1870, the capital stock of the company was further increased to $1,250,000. With this additional capital it secured the Page patents and other valuable inventions. As the business of the company in 1871 grew to be very profitable, and as opportunity was constantly presented for the extension of its service to other cities, negotiations were entered into with the Western Union Telegraph Company, and a contract followed by which it was agreed that the capital stock of the Gold and Stock Telegraph Company should be augmented to $2,500,000, the increase, $1,250,000, to be issued to the Western Union Telegraph Company for its Commercial News Department. This was duly accomplished, and at the annual meeting of the company held in September, 1871, the Western Union Telegraph Company came into practical control of the Gold and Stock Telegraph Company, through the election of the following board of directors: James H. Banker, Horace F. Clark, William Astor, Tracy R. Edson, Marshall Lefferts, Alonzo B. Cornell and Joseph M. Cook.

(To be continued)

The Function of the Signal Corps.*

BY LIEUTENANT W. S. PALMER.

In considering the army from a vocational or professional standpoint, there is no more interesting part than the Signal Corps.

Information gained on the field of battle, or when contact with the enemy is made—in fact, all information of any value whatever—finds its way to the proper authority over the lines of the Signal Corps. In turn these lines become the channel through which orders are transmitted for the necessary action. Of course, actually the operations do not appear in as simple a form as I have given. In fact, the interchange of messages becomes quite complicated at times, but, however intricate it may be made to appear, it will be found by analysis to be governed by the general principles here laid down.

There is no part of the army which plays such an important part, in time of war especially, as the Signal Corps and how important the Signal Corps is to the service some idea may be gained of the class from which must be drawn the men for its several kinds of organizations.

I will give a brief explanation of the several methods of transmitting information. First, and probably of the most importance because of its simplicity, is the telegraph. This system requires for its operations telegraphers familiar with the Morse code and linemen with knowledge of the construction of both permanent and temporary lines. Of course, it does not follow that all men in a telegraph battalion are either telegraphers or linemen. In fact, such an organization must include in its personnel cooks, auto drivers, mechanics and others. As a matter of fact, a so-called telegraph battalion is one-half telephone and one-half telegraph equipment. These organizations are employed in maintaining communication of a more permanent nature. It is more than likely that the automobile will be used as a means of transportation for telegraph battalions.

In the field battalions the organization and equipment is somewhat different from the telegraph organizations, there being three different companies in each battalion—first, a wire company; second, a radio company; and lastly, an outpost company. As may be seen from the names, the functions of each of these organizations are quite different from the others, as is also their equipment and method of transportation.

The first named or wire company maintains communication between divisional or brigade headquarters, using temporary lines and the buzzer for this service. Because of the necessity for extreme mobility and great speed these companies are furnished with the horse for transportation. A word about the buzzer will be appropriate here as completing the rough sketch of a wire company. This is in reality a telephone and telegraph instrument combined, and gives very satisfactory service for the purpose. It may be connected to lines already in operation for other systems without interference. This instrument weighs approximately six pounds and is therefore easily transported.

A radio company is just what the name implies—a wireless telegraph organization—and its duties are to keep the cavalry in touch with the division commander, and also to keep separate columns in touch on the march. With an outpost company the duties are various, and for that reason men of all capabilities are needed in forming its personnel. Its equipment consists of light field telephone switchboards, together with field telephone sets.

Other methods than those referred to are frequently used in transmitting information, such as the wig-wag and semaphore systems, which are used for sending messages by means of a telegraph code; the heliograph, acetylene lanterns, rockets, pistols, guns, etc. These, however, have a smaller radius of action and as a rule are subject to disadvantages which at times preclude their use. For certain purposes, however, one or more of these auxiliary methods are very well adapted.

Thus, the use of rockets or large guns as a general alarm signal is very much better than any other method by reason of the large area of territory covered and consequently the large number of men simultaneously warned. However, as different conditions are always occurring, it is impracticable to determine in advance what method will best serve, and it is only by being prepared to use any and all means at hand, and at times to invent new methods, that the Signal Corps can most efficiently perform its duties.

Therefore, the men enlisted in the Signal Corps must be of a high standard and should be well equipped as to preliminary education along electrical lines. However, it is not absolutely essential that all men be electricians, as the corps conducts instruction in special schools and in the field, thereby fitting men not only for their special work in the Signal Corps, but, as has occurred in many cases, putting them in a position to hold very good situations in civil life. This is one of the greatest advantages of enlistment in the Signal Corps, as a man gains the best of health due to out-of-doors activity, and at the same time receives an education of great aid to him in his civil pursuit. For all of this he is well paid, his pay ranging from $30 to $81 per month, besides his clothing, rations, medical attention, etc. This pay should not be compared directly with the same amount of money earned in civil life, as it more nearly represents the cash that a man can save per month. In civil life if a man has available at the end of each month, after all expenses have been paid, a sum as low as $30 even, he is holding a very good position.

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*Telephone Engineer.

ASSESSMENT.—The Telegraph and Telephone Life Insurance Association has levied assessment 624 to meet the claims arising from the deaths of C. F. Cook, at Racine, Wis.; G. W. Snyder, Washington, Ind.; M. K. Reeves, Atlantic City, N. J.; G. A. Rawlins, Roselle, N. J.

NEWS INJUNCTION IN FORCE.—The final order, putting into effect the injunction restraining the International News Service from using the news gathered by The Associated Press was filed a few days ago. Counsel for the defendant failed in three efforts to secure a delay in filing the order.

Scientific History.

BY DONALD McNICOL, NEW YORK.

One hundred years ago (1817) Francis Ronalds, in England, constructed an experimental telegraph line employing a "single needle," operated by a friction electric generator, or a Leyden jar. At the receiving end of the line a pith-ball electrometer in connection with a clock synchronized with a similar clock at the transmitting end indicated the intended signals. This was the first "dial" telegraph system. A distance of eight miles was covered.

Dr. John Coxe, of Philadelphia, Pa., independently duplicated telegraph experiments performed by Soemmering, of Munich, Bavaria, whereby communication was carried on by means of a plurality of wires. At the receiving station the electrical decomposition of water observed in the circuit of any selected wire indicated the desired letter.

Ronalds observed that an electric impulse would probably encounter retardation in a long underground or submarine conductor. (His ideas on this subject could not have been very clear, as the difficulties he experienced were with an underground wire but 525 feet in length, and "retardation" as later understood was not successfully investigated until seven years later, by Faraday).

Berzelius discovered selenium.

SEVENTY-FIVE YEARS AGO (1842).

Joule, in France, discovered that iron alters its dimensions when magnetized.

Joseph Henry, in America, in view of the experiments of Savery, pointed out that the discharge of a Leyden jar is oscillatory. Henry stated: "The discharge, whatever may be its nature, is not correctly represented (employing for simplicity the theory of Franklin) by the single transfer of an imponderable fluid from one side of the jar to the other; the phenomenon requires us to admit the existence of a principal discharge in one direction, and then several reflex actions backward and forward; each more feeble than the preceding, until equilibrium."

FIFTY YEARS AGO (1867).

The Callahan three-wire stock quotation printing telegraph invented.

Clerk Maxwell, in England, announced the electro-magnetic theory of light.

The "Ladd" dynamo exhibited at the Paris Exposition.

Cromwell Varley, of England, engaged by the Western Union Telegraph Company to come to America for the purpose of investigating the electrical conditions of American telegraph lines. Evidently there was not in America an electrical engineer qualified to do this work.

Conductors and Insulators.

Conductors and insulators are distinguished by their ability to carry electric charges from point to point. No hard and fast line can be drawn between conductors and insulators. All so-called insulators conduct electricity to some extent and all so-called conductors possess varying degrees of resistance according to the material. Silver conducts an electrical current more freely than does any other substance; that is, it has the least resistance; dry air has the most resistance of all insulators.

Sazarac, a Word of Mystery.

Sazarac is the name of a celebrated drink in New Orleans and most all visitors to the Crescent City are sooner or later introduced to this famous beverage. Several telegraph people were recently on their way by boat to New Orleans. A wireless message via Key West was sent from the party on the ship to a friend in the city on the Mississippi River stating that they expected to reach port in time to enjoy a Sazarac. The Government censors were not slow in deciphering the word Sazarac to mean all sorts of unfriendly acts towards the United States Government. Secret service men and others met the steamer at New Orleans and the party was shadowed until they at last wandered into the palace of Sazarac where the secret service contingent were enlightened on the true meaning of the word that had puzzled them for so many hours.

Simple Methods of Testing for Telephone Troubles.

One of the most useful devices for locating telephone wiring troubles is a headband receiver of from 250 to 500 ohms resistance—the same type of receiver as is used by telephone operators. This type of headband has the advantage of allowing the free use of both hands for testing.

In testing for doorbell trouble, for instance, remove the cover from the push button, touch one cord end to each terminal and listen. If no sound is heard in the receiver it is an indication that the circuit is clear and the wiring is all right. If a frying noise is heard it indicates a loose joint or poor connection on the circuit—on the bell, probably If the terminals are pushed together to ring the bell while the receiver cords are still connected and a sharp back kick is heard in the receiver, it indicates that the bell is either short-circuited or the tension on the clapper is too great. If there is a rattling sound, the bell has been ringing. If every operation produces but a very faint response in the receiver, it means that the battery is weak.

After a little practice the trouble man can soon find very many uses for a receiver of this kind. By this push-button test method, trouble can be readily located and remedied. A double receiver headband should never be used, but a single one, so as to have one ear free for listening to outside noises.

C. B. Rawlins, New Secretary-Treasurer, O. R. T.

Mr. C. B. Rawlins, recently elected grand secretary and treasurer of the Order of Railway Telegraphers, was born in Columbus, Ohio, January 10, 1880, and entered the telegraph service in December, 1894, at Milledgeville, Ohio, on the Cincinnati, Hamilton and Dayton Railroad. He has held various telegraph and agents' positions on different railroads and was train dispatcher for the Missouri Pacific and the Southern Railroad.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

JOINT RESISTANCE OF CIRCUITS

The resistance of a conductor of a given length decreases in proportion as its weight, or mass, is increased. Thus, if a wire one mile in length and weighing two hundred pounds be assumed to have a resistance of six ohms per mile, a wire of the same length and material, weighing four hundred pounds, will have a resistance of three ohms.

If, as in Fig. 1, a number of conductors be connected with a given battery, or other source of electromotive force, the whole may be classed as one circuit, the total resistance of which will be that due to the internal resistance of the battery and the exernal resistance of the conductors; the internal resistance in this instance being the "joint" resistance of the three conductors. .

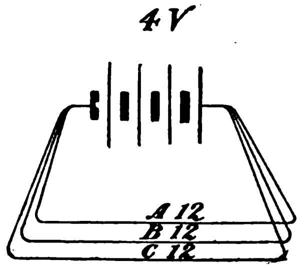


FIG. 1—JOINT RESISTANCE.

Let *A B C* represent three copper wires of equal diameter and length, weighing three pounds each, and each having a resistance of twelve ohms. It is evident then that, as regards electrical resistance, these three wires are equal to one wire of similar length weighing nine pounds. Consequently, if the three wires be measured together it will be equal to measuring one wire of nine pounds weight and hence, the joint resistance of the three wires will be but one-third of twelve ohms, namely four ohms, and, if we neglect for the present the resistance of the battery, the total resistance of the circuit will be four ohms. Conductors thus arranged are said to be in "multiple" or in "parallel," and such a circuit as that shown in the figure is termed a "divided circuit."

If the weight, length and material, and, consequently, the resistance of each conductor of a circuit were the same, it would be easy to calculate the joint resistance of any number of circuits arranged in multiple. For instance, the joint resistance of, say, twenty wires of equal weight and length, each having a resistance of twenty ohms, would be equal to the resistance of one wire of similar length weighing twenty times as much as any one of the twenty wires; that is, the resistance of such a wire would be one ohm. Nor is it necessary, to arrive at this conclusion, that each of, say, twenty wires, should be of the same weight and length. If each wire has the same resistance, the joint resistance of the twenty wires will be one ohm. For, evidently, electrically considered, a wire measuring twenty ohms, whatever be its actual weight and length, will be the equivalent (as to resistance) of any other wire measuring twenty ohms. Thus an easy way to find the joint resistance of a number of circuits of equal resistance, in multiple, is to divide the resistance of any one of the circuits by the total number of wires as in the last instance: $\frac{20}{20} = 1$ ohm.

(To be continued)

Telephony.

THE CONDENSER (*Continued*)

If the condenser is connected to a source of electricity in which the pressure is fluctuating, a current will flow into it while the pressure is increasing, there will be no flow while the pressure is steady, and the current will flow from the condenser back to the source while the pressure is decreasing. A current flows into or out of the condenser only when the pressure at its terminals is changing. A condenser will therefore permit the flow of alternating current, but will prevent the flow of direct current.

How this property of the condenser serves to prevent a constant flow and subsequent waste of direct current may be seen by reference to Fig. 1. When the subscriber is not using his telephone, his receiver is on the hook and the talking circuit is opened at A and A'; therefore, the only path for electricity is through the ringer and condenser. As the condenser transmits alternating current, it enables central to operate the ringer at the subscriber's station, while at the same time it prevents the flow of direct current through the ringer.

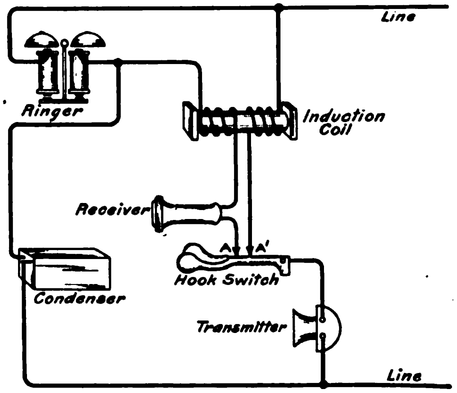


FIG. 1—HOW A CONDENSER PREVENTS WASTE OF DIRECT CURRENT.

QUESTIONS IN TELEPHONY.

Is the ringing circuit open or closed?

Do the direct and alternating currents pass through the same pair of wires or through different wires?

What is the most important use of the condenser in the telephone?

Radio Telegraphy.

DEFINITIONS OF ALTERNATING CURRENT TERMS.

For a proper understanding of some of the points to follow, definitions and explanations are given below of the more common terms in use in the practice of alternating currents.

The frequency with which the charges in the condenser C (see Fig. 3, June 1 issue) are renewed by the transformer depends, among other things, upon the rate at which the voltage and current delivered by the alternator is varying. Fig. 1 represents the manner in which these quantities vary, where the set of values ABCDE, half of which is positive and half negative, is called a cycle of voltage or current, the symbol for which is often thus written ∿. The number of cycles per second is called the frequency and the letter "*n*" or "*f*" is often used as its symbol. In commercial alternators used in radio-telegraphy the frequencies are generally 60, 120, 480 or 500 cycles per second; that is, there are 60, 120, etc., complete sets of values, such as ABCDE of Fig. 1, per second, or $n = 60$, 120, etc. Half a cycle, such as the set of values ABC or CDE of Fig. 1, which may be either positive or negative, is called an alternation. There are always twice as many alternations per second as there are cycles. The frequency of an alternating current is sometimes given in alternations per minute instead of cycles per second; thus, a current of 60 cycles per second is of the same frequency as one of 7,200 alternations per minute. The time taken to complete one cycle is called the period, and the letter *T* is often used as its symbol; thus if there are 500 cycles per second, the time to complete one cycle is 1/500 second or 0.002 second; that is, $T = \frac{1}{500}$ second or $T = 0.002$ second. Similarly the time for one alternation of a current of the same frequency is 1/1,000 second or 0.001 second. The relation between the frequency in cycles per second and the period in fractions of a second is given by the formula $T = \frac{1}{N}$ or $N = \frac{1}{T}$.

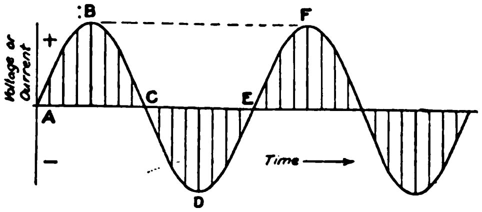


FIG. 1—ILLUSTRATING VARIATION OF CURRENT OR VOLTAGE.

The highest value of the current or voltage in any alternation, as at points B, D, etc., of Fig. 1, is called the amplitude or sometimes the peak of the curve.

It will be noted that there is a similarity between the sustained oscillations (see Fig. 4, April 16 issue) and the alternating current or voltage as represented in the illustration, Fig. 1. The two curves have the same shape or form, being known in trigonometry as sine curves, but they differ in the greatly increased frequency of a hundred thousand or million per second in the radio circuits (the closed and open oscillating circuits), as compared with that of 60 to 500 per second in the power circuits (the alternator and transformer circuits). It is the general practice to speak of the number of oscillations or of cycles per second in radio circuits, but only of the number of cycles per second in power circuits.

(To be continued)

Shop Talk.

BY THE OBSERVER.

We dwelt upon swings in our last epistle. Now we come to other bugbears, viz.: Unevenness, adjustment of points, magnets, etc.

Next in order to the great loss of time due to real and imaginary swings, I feel safe in saying that unevenness is the next greatest source of delay. No one will deny that an uneven circuit is a source of annoyance and if the bias is too great, much breaking will result. However, we frequently hear repeater men arguing the case, and one cites as his assurance that it is uneven because he gets twelve milliamperes on one pole and fourteen on the other. Regardless of the fact that the same man can read the sender all right, he stops the current to "even it up," a circuit that is no more uneven than that is not uneven at all, as far as practice and results are concerned. Unevenness of a circuit consists of a variation between the strength of signals as compared with the open and closed key, judging the same for a manual circuit from an acoustical effect. I do not wish to be understood as saying that a milliammeter needle does not pick out flaws much quicker in many cases than the law of acoustics, but I do say that such cases as I cite are quite numerous and as such are a source of hindrance rather than help.

One of the greatest causes for real unevenness is due to repeater men balancing to their needle, but never centering their relay armatures. •Think it over. Another cause for unevenness is (if the power is even, and circuit devoid of great leaks) hanging of pole changers, relay, or sounder armatures in their trunions.

One mistake that many make is to assume that because the signals sound all right passing them, that the signals must necessarily be going through perfectly. Whenever a man tells you that he reads your key all right but does not get even signals from the man next to you, while you get them all right, be sure and center your relay, clean your points and watch results. Above all things do not start any unpleasant remarks, or delay the circuit by idle talk. Be polite and brief, but to the point. On a fast circuit the loss of fifteen minutes may necessitate holding up, or detouring thirty or forty messages involving the work of two men. Therefore, while we are after maximum efficiency, let us not overlook these facts.

Keep your power even at your generators.

(To be continued)

Efficiency Engineering in the Telegraph Service.

(Continued from page 321, July 16.)

Service seems to be a topic that is never overworked in its application to telegraphy and telephony. The reason is obvious and is found in the two words "Eternal vigilance." Poor service shines forth brilliantly, particularly poor telephone service. The individual user of the telephone is at once informed of its shortcomings. Poor telegraph service is hidden from view for at least a time. Those in charge of telegraph and telephone plants should never relax their efforts to render a perfect service as far as possible.

Mr. S. M. English, general manager of the Western Union Telegraph Company at Dallas, Tex., recently addressed his managers on the subject of service and made some very good points which are worth reprinting in these columns. He states:

Service should be a good investment—an asset.

Most of it is.

Some of it is a speculation.

Some of it is a liability.

The moment service ceases to be voluntary it ceases to be good service.

I have known men to loaf on their jobs and kick for overtime.

The company buys your time and may know that you are on duty every minute you are paid for, and you might even hang around after hours without pay, doing a little extra job, or you may just be doing the work you should have done on your regular time that you wasted.

But if you are not voluntarily rendering your best service to the company and its patrons during the time you are paid for, you are not "toting fair" with the company, its patrons or yourself.

With yourself, because you are not fooling anybody else, not even the man to whom you look for advancement.

You are cheating the company and its patrons by not giving them the service they pay for.

The company has proven its willingness to pay for good service, as you will agree when you compare salaries of today with those of a few years ago, when about all it got for the poor salaries paid was time.

Men will always voluntarily render good service when they are happy and feel that they are getting a square deal.

For example, the operators in relay offices voluntarily increased the value of their services by handling more business over the same wires with less delay and fewer errors.

In appreciation the company voluntarily increased their pay and reduced their working time one hour.

Of course there are a few who have not earned this consideration, but then every business ha profit and loss account. The produce man can save loss by culling out the rotten apples before they spoil the good ones. Fortunately telegraph employes have awakened to the need of steering clear of "rotten apples" and paddling their own canoe.

The time when one man could demoralize a whole force is ancient history.

Anyway, service is not a thing to brag about. Every customer has a right to expect it. It rightly belongs to him—whether he be a two-bit customer or a thousand-dollar customer, he is paying his share of your salary and mine, and all of us want to feel he is getting what he is paying for—service, our best service.

Service to the customer is always an investment. Whether or not it is profitable to him depends solely upon the messengers, the clerks, the operators, the manager and all the rest of us.

A few moments' delay or an error may cause serious financial loss to a customer during an active market.

Delays and errors cost the company thousands of dollars which might be saved with a little more care all along the line.

Handling messages correctly and promptly has more to do with holding business than any other feature of our service. Managers and salesmen can sell service but they cannot keep it sold "on a windy."

Quoting a bank president:

"If on looking us over a customer feels we are weak in any one respect, that one weakness will outweigh a host of arguments for strength.

"So we must watch the little things. All we do should be done as for a 'prospective' customer—as for the man or woman who is not yet on our books, but who we hope will be.

"The prospective 'savings' depositor may some day be our biggest general customer. We've seen just such things happen. Therefore our service can never discriminate. It must be fair to the prospect before it can be fair to the actual customer, or, in turn, to the bank."

There isn't much difference between service to the patrons of a bank and to those of our company. In fact both serve the same customers, especially business men, whom I have no doubt make comparisons of our policies and methods of serving them.

There is possibly this difference in our favor. We represent a service more far reaching than any bank.

One difference in favor of the service of a bank is sometimes the appearance of those who serve.

I note that some telegraph employes, including a few of those in the more responsible positions, are inclined to neglect their personal appearance.

They forget to shave. They wear soiled shirts and collars. They allow their clothing to remain dusty and spotted. They forget to get a shine. They wear their ties until they ravel and are spotted with grease and dust.

They think it is because of the high cost of living. It is most likely thoughtlessness or neglect.

Anybody can use a safety razor, which can be bought for from ten cents up.

It doesn't cost much to get a good shine and a good brushing is always thrown in.

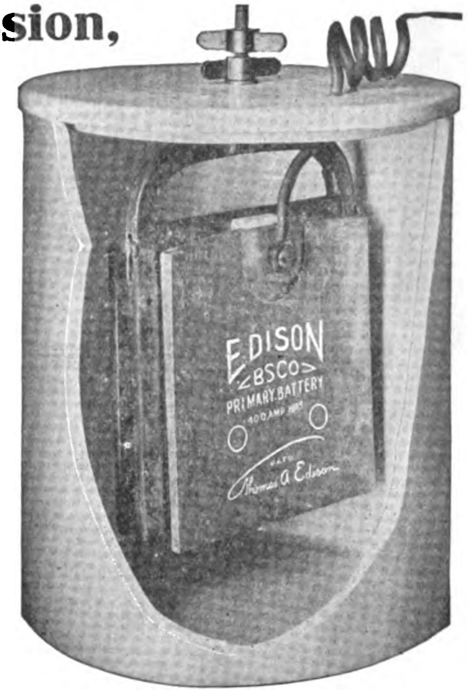
It doesn't speak well for the company for an unkempt representative to introduce himself and begin talking service, when every business man knows that the first principle—the very foundation of good service—is neatness and refinement.

Fortunately most men voluntarily do their best to serve and do not overlook these first principles.

(To be continued)

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

Improve Your Service by Installing Edison.

Thomas A. Edison
THOMAS A. EDISON, Incorporated
247 Lakeside Avenue ORANGE, N. J.

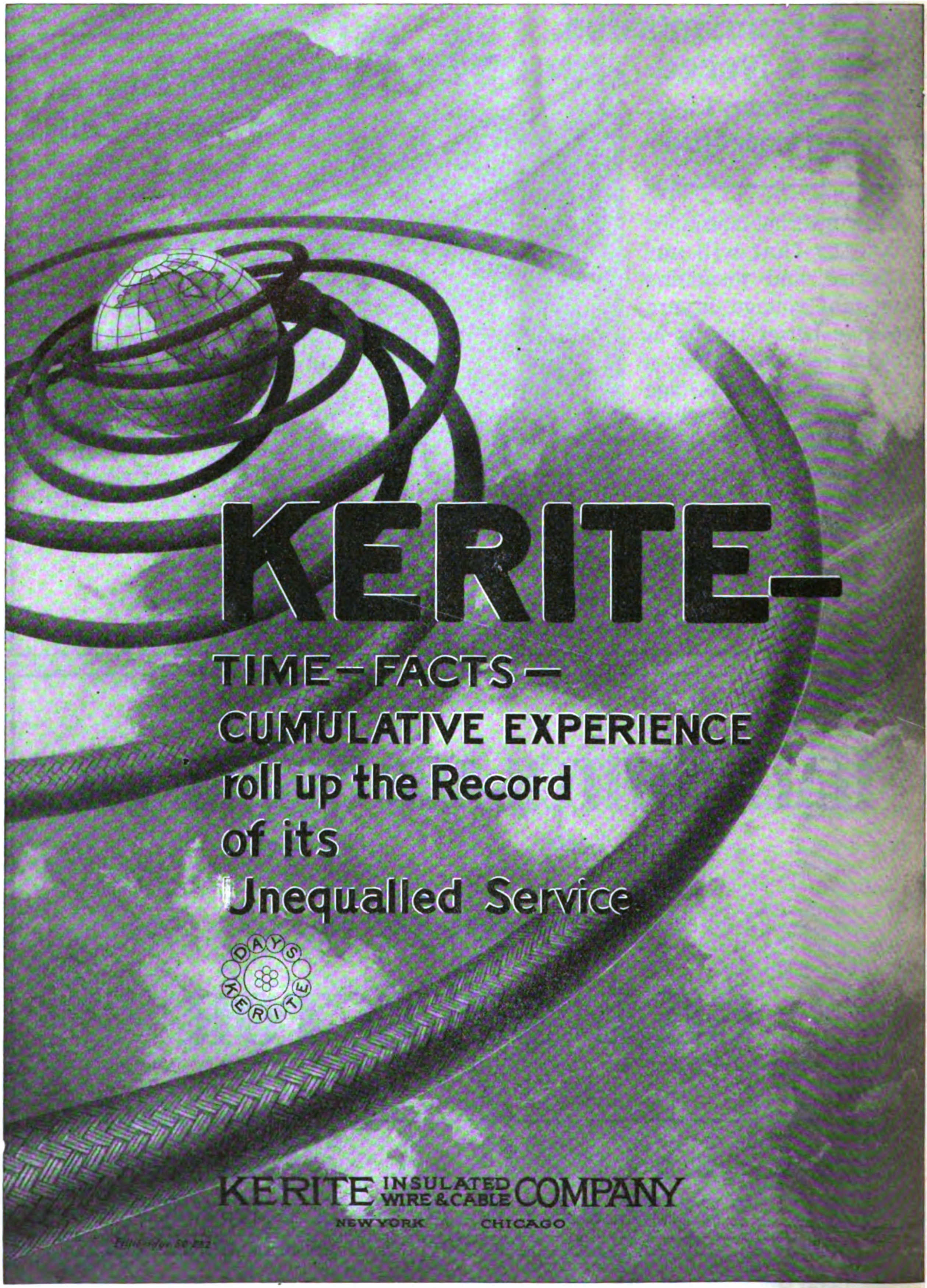
HALL SWITCH AND SIGNAL CO.

New York Chicago

MANUFACTURERS OF THE

GILL SELECTOR

THE UNIVERSAL SELECTOR
FOR TELEGRAPH AND TELEPHONE



KERITE—

TIME—FACTS—
CUMULATIVE EXPERIENCE
roll up the Record
of its
Unequalled Service

DAYS KERITE

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO

THE RAILROAD.

Convention of Railway Telegraph Superintendents Postponed.

Mr. W. L. Connelly, secretary of the Association of Railway Telegraph Superintendents, has mailed a circular letter to the members in which he says:

"With a view of conserving our time and resources to the end of being able to do our part in meeting the present war situation, the executive committee, after due consideration, has decided to indefinitely postpone the annual meeting which was to have been held in Washington, D. C., on September 18. The executive committee has further decided to call a special meeting of the Association in Chicago for a short session of one or two days during the month of November of this year. You will be advised later the exact date. This meeting is to be strictly a business session, free from entertainment.

"It is desired that all the committees continue their work as far as possible, and be prepared to present reports for discussion and action at the proposed Chicago meeting in November.

"The necessity of postponing our annual meeting is, of course, to be regretted, but under the present conditions it does not seem proper or desirable to carry out our original plans."

Mr. Charles A. Goodnow, assistant to Mr. A. J. Earling, president of the Chicago, Milwaukee and St. Paul Railway Company, has been elected a vice-president of the corporation. He began his railroad experience as a telegraph operator.

Mr. M. M. Shannon, division operator, Pennsylvania Railroad Company, Elmira, N. Y., in remitting to cover his subscription for another year writes: "It is certainly worth the price and is one of the means in which us oldtimers can keep in touch with one another."

MUNICIPAL ELECTRICIANS.

Mr. J. W. Kane, an electrical engineer with the General Electric Company, has been awarded the appointment of superintendent Fire Alarm Telegraphs, Newark, N. J., to succeed Mr. Adam Bosch, retired. Both Mr. Bosch and Mr. Kane are graduates of the five-year Cooper Union Scientific Course. Mr. Bosch had charge of the fire alarm telegraphs at Newark for over forty-one years.

Visual and Audible Signals for Policemen.

One of the most valuable adjuncts to a police signaling and telephone system is a system of visual and audible signals whereby the central office may at any time call any or all patrolmen to the street stations for the purpose of receiving instructions.

The importance of this method of signaling to patrolmen at any time from police headquarters cannot be overestimated, as it eliminates all possibility of duty-shirking on the part of the force. Experience has shown that the men will not fail in their duty where there is a chance of being called by headquarters at any moment. In every city or town there are many points at which these visual and audible signals can be placed and operated to advantage. In some cities a light elevated above every street station might be considered necessary. In other places a few visual and audible signals may be placed throughout the city in such a manner as to meet all requirements, or in some cases a single light might be so located at such an elevation as to be visible to all patrolmen on duty.

Visual and audible signals consist of lights for use at night and electric horns or vibrating gongs for use in the daytime. These signals are operated from the central office, and the central office equipment is arranged in such a manner that any code of signals may be transmitted to the patrolmen, indicating that one or more patrolmen in a certain district are required to report at the street stations for instructions, or the entire force may be summoned at one time in case of an emergency. The system is flexible and may be adapted to varying conditions.

INDUSTRIAL.

Western Electric New Houses and Organization Changes.

To better serve the trade in Connecticut and adjacent territory, a Western Electric office and warehouse has been opened in New Haven at 135 Wood Street, and Mr. Tyler L. Holmes is in charge.

Mr. S. Greenfield, of the Philadelphia house of the company, will head the sales force of the new Baltimore branch, which was opened July 16 at 425 East Oliver Street.

The company will be represented in Charlotte, N. C., by a warehouse and sales office at 238 West First Street. Mr. R. H. Bouligny will be in charge.

In order to adequately take care of the growing demands of the business in the Northwest the warehouse and sales office of the Western Electric Company has just moved into new and commodious quarters at 84 Marion Street, Seattle, Wash.

Mr. W. H. Quirk has been appointed manager of the Western Electric house at Cincinnati, Ohio. Mr. W. L. Sioussat will succeed Mr. Quirk as stores manager in the company's Cleveland house.

"REMCO"
ALTERNATING CURRENT SELECTORS
(Controlling Patents)

Tested and Proved

Manufactured only by the
RAILWAY ELECTRIC MANUFACTURING CO.
250-252 West Water Street
MILWAUKEE, WIS.

Origin of The Western Union Telegraph Company.

(Continued from page 325, July 16)

CHAP. 568.

AN ACT in relation to Telegraph Companies.
Passed May 2, 1870.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. In order to perfect and extend the connections of telegraph companies in this State, and promote their union with the telegraph systems of other States, any telegraph company organized under the laws of this State may lease, sell or convey its property, rights, privileges and franchises, or any interest therein, or any part thereof, to any telegraph company organized under, or created by, the laws of this or any other State, and may acquire by lease, purchase or conveyance the property, rights, privileges and franchises, or any interest therein, or any part thereof, of any telegraph company organized under, or created by, the laws of this or any other State, and may make payments therefor in its own stock, money or property, or receive payment therefor in the stock, money or property of the corporation to which the same may be so sold, leased or conveyed; provided, however, that no such purchase, sale, lease or conveyance by any corporation of this State shall be valid until it shall have been ratified and approved by a three-fifths vote of its board of directors or trustees, and also by the consent thereto in writing, or by vote, at a general meeting duly called for the purpose, of three-fifths in interest of the stockholders in such company, present or represented by proxy, at such meeting.

§ 2. This Act shall take effect immediately.

STATE OF NEW YORK, }
Office of the Secretary of State. }

I have compared the preceding with the original laws on file in this office, and do hereby certify that the same are correct transcripts therefrom, and of the whole of said original laws.

Given under my hand and seal of office, at the
City of Albany, this day of , in
the year one thousand eight hundred and
Secretary of State.

NEW YORK AND MISSISSIPPI VALLEY PRINTING TELEGRAPH COMPANY.

ARTICLES OF ASSOCIATION AND INCORPORATION.

WHEREAS, Sanford J. Smith and Isaac Butts, under and by virtue of a contract between them of the one part, and Freeman M. Edson and Samuel L. Selden of the other part, are entitled to the exclusive right of establishing and constructing a line of telegraph to be operated by the instrument known and patented under the name of "House's Printing Telegraph," between Buffalo, in the State of New York, and St. Louis, in the State of Missouri; and

WHEREAS, The said Sanford J. Smith and Isaac Butts are now engaged in constructing a line of telegraph between the places and for the purpose above mentioned.

Now, therefore, for the purpose of completing, owning and operating said telegraph line, the subscribers hereto have agreed and do hereby agree to form an incorporated association or company pursuant to the act of the Legislature of the State of New York, entitled "An Act to provide for the Incorporation and Regulation of Telegraph Companies," passed April 12, 1848, upon the terms and conditions following, to wit:

Art. 1. The name of the said Company shall be "The New York and Mississippi Valley Printing Telegraph Company."

Art. 2. The route of the said telegraph line shall pass through this State, from the city of Buffalo to the State of Pennsylvania, along the south side of Lake Erie.

Art. 3. This Company shall own and operate the residue of the said telegraph line from the boundary of the State of New York through the several States, to the city of St. Louis, touching at Cleveland, Columbus and Cincinnati, and thence to St. Louis by such route as shall be designated by the Directors, to be constructed by the said Sanford J. Smith and Isaac Butts, under and by virtue of authority from the said States respectively, or from the persons whose lands the said line may cross.

Art. 4. The capital stock of said Company shall be three hundred and sixty thousand dollars, to be divided into three thousand six hundred shares of one hundred dollars each, but the amount of said stock may be increased in the manner hereinafter prescribed.

Art. 5. The persons whose names are hereto subscribed are the shareholders of said capital stock, and their places of residence and the number of shares held by each are set opposite to their names respectively.

Art. 6. This Company shall commence on the first day of April, eighteen hundred and fifty-one, and terminate on the first day of April, nineteen hundred and fifty-one.

Art. 7. This Company is to have the exclusive right, subject to the rights of the aforesaid Smith and Butts, of constructing and using said Printing Telegraph upon the line aforesaid, under letters-patent issued to Royal E. House, as the inventor thereof, during the life of said patent, and of any renewals thereof, and the right of constructing and using House's insulators and of all improvements made or to be made by said Royal E. House in the Printing Telegraph or in the apparatus or machinery connected therewith.

The assent of the patentees to these articles is to be obtained and properly attested prior to the payment of any part of the subscriptions to the stock. As soon as practicable after twenty-five per cent. of the cost of building said line shall have been paid by the subscribers to the said stock, the rights above specified shall be transferred to the Company by deed or other good and sufficient conveyance.

Art. 8. The one-half of said capital stock, to wit: one hundred and eighty thousand dollars—shall be appropriated in payment for the exclusive right of constructing and using the said Printing Telegraph upon the line aforesaid, under the letters-patent issued to Royal E. House as the inventor thereof, during the life of said patent, and of any renewals thereof; the other half shall be devoted to the object of constructing, completing and putting in operation the said line.

Art. 9. The line is to be constructed by Sanford J. Smith and Isaac Butts, above named, who are to receive therefor the sum of one hundred and eighty thousand dollars, to be paid to them out of the moneys subscribed to the capital stock of said Company; and provided the full amount shall not be realized from subscription, they shall be entitled to receive, and shall accept the balance in stock.

Art. 10. The affairs of this Company shall be managed by a Board of nineteen Directors, who shall choose a President and Vice-President from their number; the Board shall also have power to appoint a Treasurer and Secretary, who shall hold their offices respectively during the pleasure of the Board, or they may appoint one person to act both as Secretary and Treasurer.

They shall have power to fix the salaries of the President and of all the other officers and agents of the Company, and to adopt such resolutions and by-laws not conflicting with any provisions of these Articles, as they may think proper for the regulation of the business of the Company. A majority of the Directors, including the President or Vice-President, shall constitute a quorum to do business. Special meetings of the Board may be called by the President as often as occasion may require.

They shall hold regular quarterly meetings on the third Tuesdays of January, April, July and October, respectively, of each year, and may declare dividends at such meetings, or as often as they may deem expedient.

They may also designate three of their number who, with the President and Treasurer, shall constitute an Executive Committee who shall, for the time being, have charge of the affairs and business of the Company, subject to the control of the Board.

Art. 11. The Directors shall be chosen by the stockholders at their annual meeting, and shall hold their offices for one year, and until others are chosen.

No person shall be Director unless he is a stockholder in the Company. Any vacancy in the Board of Directors may be filled for the residue of the year by the remaining Directors.

The stockholders shall, at the same time, choose three persons to act as Inspectors, to preside at the next succeeding annual election.

Until the first annual election of Directors, or until other persons are appointed in their places, as hereinafter provided, the following persons shall compose the Board of Directors, to wit:

Henry S. Potter, Addison Gardiner, Freeman Clark, Isaac R. Elwood, George W. Burbank, Joseph Hall, George H. Mumford, E. Darwin Smith, Isaac Hills, Samuel Medary, Joseph Medbery, James Chappel, Rufus Keeler, Royal E. House, Freeman M. Edson, Samuel L. Seldon, Isaac Butts, Sanford J. Smith and Hiram Sibley.

In case any of the aforesaid persons shall not become stockholders of this Company within sixty days from the organization thereof, they shall cease to be Directors, and the remaining Directors may supply the vacancy until the said election.

Art. 12. The President shall preside at all meetings of the Directors, and also of the stockholders except during the election of Directors. He shall draw all drafts upon the treasury for the disbursements of the Company, according to the rules prescribed by the Board. He shall sign all certificates of stock and shall be ex-officio President of the Executive Committee. In the absence or inability of the President, the Vice-President shall act in his stead, and possess all the powers and perform all the duties of the President.

Art. 13. The Secretary shall keep the minutes of the proceedings of all the meetings of stockholders, and of the Directors, and of the Executive Committee, which, at all reasonable hours, shall be open to the inspection of any stockholder; he shall countersign all certificates of stock; he shall keep the general accounts of the Company, as well as a record of all issues and transfers of stock; and shall perform all such other duties as may be imposed upon him by resolutions or by-laws adopted by the Board of Directors.

Art. 14. The Treasurer shall receive all moneys collected, pay all drafts and dividends made pursuant to the rules and regulations of the Board of Directors, and shall keep a faithful account of his receipts and disbursements; and at each quarterly meeting of the Directors, and oftener if required, he shall exhibit to them a true transcript thereof. He shall also, when required, give security to the Company, in such form and to such amount as the Board of Directors may prescribe, for the faithful discharge of his duties.

While the line is in progress of construction, the Treasurer shall also receive and have the custody of the moneys subscribed for building said line, which subscriptions shall be payable to his order; and he shall pay to the said Sanford J. Smith and Isaac Butts the moneys so received by him, under the direction of the Executive Committee, as fast as the same shall be required for the construction of the said line; but the amount so to be paid shall not, at any time, exceed the value of the work actually done, and materials delivered or procured; which materials so delivered or procured shall thereupon become and be the property of the Company.

The Board of Directors or Executive Committee may exact from the said Smith and Butts adequate security for the faithful appropriation of all moneys paid to them for the purposes herein specified.

(To be continued)

Morse-Phillips High-Speed Telegraph.

The Phillips Manufacturing and Trading Company, Bridgeport, Conn., is now manufacturing the instruments used in the Morse-Phillips high-speed telegraph system, and orders for them will be filled according to the date of their arrival. The company has ample manufacturing facilities and will fill orders with the least possible delay.

The company also deals in music machines of all makes, and records, giving the preference to the best. Descriptive literature will be sent to anyone interested.

This company was founded by Mr. Walter P. Phillips, the well known old-time telegrapher and newspaper man.

MR. JEFF W. HAYES' DEPARTMENT.

Keep Your Word.

The Pendleton "Round-up" was a weekly journal conducted by Homer H. Hallock, an old time telegrapher, who was widely known to the fraternity on the Pacific Coast twenty-five years ago.

Hallock was a natural wit and he took great delight in playing practical jokes on his friends, always, however, with no venom or animosity to inspire him.

Down the line at Cayuse, some few miles away, as distances are reckoned out West, Tom O'Rourke labored as night operator. O'Rourke was an expensive fellow and when he came to the city, his expense account partook of recklessness and he would proceed homeward entirely without money.

It was upon the occasion of one of these periodical visits to Pendleton that he came across his friend, Homer Hallock. The Cayuse operator had performed his customary stunts with the usual result, and he determined to ask his old friend, Hallock, for a loan.

"I just need ten dollars, Homer, and if you will loan it to me, I will surely return it on the first of the month. Yes, Homer, if I am living, you will surely have the money on the first of the month."

Hallock demurred a little, protesting that he, also, was hard up, but finally yielded to his friend's importunities, which were always accompanied with the statement: "If I live, I will surely return the loan on the first of the month."

The money was handed over to O'Rourke, who made a final declaration as to the date of reimbursement, prefixing his remark with: "If I live."

Days passed by, the first of the month came and passed into history, but nothing was heard from O'Rourke. About the end of the third week the following item appeared in the "Round-up," which was read with much interest by the operators in that vicinity:

"DEATH OF THOMAS O'ROURKE."

"We are pained to be called upon to chronicle the untimely demise of our old friend and colleague, Thomas O'Rourke, which took place recently. The place of his death and the date of the same is unknown to us at present. Mr. O'Rourke's early demise will be regretted by a wide circle of friends on the railroad and telegraph circuits."

Two days later Tom O'Rourke entered the office of the Pendleton "Round-up" and inquired for Homer Hallock. There was blood in his eye and a fierceness in his tone when that gentleman appeared.

O'Rourke demanded an explanation of the death notice which appeared in the "Round-up," declaring it had occasioned him endless explanation and expense to inform his friends that he was still in the land of the living.

"Why, my explanation is very simple," said Hallock. "You remember you borrowed $10 from me last month and you promised me, over and over again, that you would return the loan on the first of the month, 'if you lived.' Well, I waited and waited several weeks after the first of the month, and, as you did not come, I naturally inferred that you must surely be dead, and so informed our readers."

The Pleiades Club.

CHAPTER XVIII.

It had been decided by the members of the Pleiades Club to send out a special train with attendants to gather in any and all stray members found loitering, so to speak, at the different wayside stopping places between the earth and Mars and bring them all into the fold under the shadow of the Telegraphers' Tabernacle. There were a number who did not respond to the roll call, and while not believing that anything could be lost in God's great economic universe, still it was thought only right to gather everybody in and have all in their respective places.

Commodore R. R. Haines, who was a leader during his sojourn on earth, was appointed captain of the expedition and a delegation selected from every section of the country and Canada were invited to accompany the craft to identify all telegraph people eligible for membership who were idling their time away among the many stopping places on this long journey.

It had been resolved to begin at the moon and work the way back, so Luna was the first satellite to be visited and, lo, and behold, Edward C. Cockey came to greet the searching party.

Mr. Cockey was astonished to see his visitors and was not at all loath to join them, the only regret he expressed being that now the sentimental young ladies would have no one to watch over them from the moon. He asked if the "Man in the moon" was still talked about on earth and was assured that he was. Aaron Hilliker sang:

"I'm in love with the man in the moon,
And I'm going to marry him soon,
And behind some dark cloud, where there's
no one allowed,
I'll make love to the man in the moon."

"That settles it and I'm with you even if I must desert my kingdom forever," cried "Happy" Cockey, as he took passage in Electric No. 1, bound for the outer regions.

The next stopping place will be "500,000-mile station," said Captain Haines, and I believe we will find some notable personages there.

It took but one hour for Electric No. 1 to make the journey to Skippityvous, as the retreat was named by Tom Dushane, the only Frenchman aboard.

"What do you know about that?" cried Ed. C Keeler, "I'll be jiggered if there isn't Col. L. D. Parker, Charles Thomas, Frank Kingsbury and Arthur W. Copp sitting out there under a big oak tree playing a series of delightful games."

Col. Parker expressed his satisfaction with his present surroundings but did not object to joining the merry party, as he remembered the many happy days spent with his comrades on earth. Charlie Thomas, Arthur Copp and Frank Kingsbury were ready to say goodby to 500,000-mile station when told of the doings on the planet Mars.

"We will stop off at Angel's Camp and pick up Samuel J. Kelley, who was with me in Los Angeles once upon a time, remarked Captain Haines, as they started out into space.

It did not take many hours to reach Angel's Camp where the whistles of their aeroplane tooted "73" to Sam Kelley, which brought that brother to the front, accompanied by Charles Stone.

The loiterers were taken aboard the car without much ceremony, neither having to undergo that irksome task of shaving and changing his clothes and both were delighted to be in such excellent company, with the prospect of meeting still more friends.

At Salt Creek, a surprise met the voyagers when it was ascertained that Frank P. Medina would be on hand to join the party. Medina had stopped off at Salt Creek with his friend, Jack O'Brien, of San Francisco, and had been having an enjoyable time, but was now ready to climb higher toward the goal.

And so it kept up all day, the passengers regaling themselves by merry songs and stories, in which Col. L. D. Parker took a leading part.

The Colonel was anxious to hear the latest news from Mother Earth and affectionately inquired after Edward J. Nally, Edgar W. Collins. A. B. Richards, A. A. Briggs, Thomas P. Wheeler, Harry A. Tuttle and many others, all old coworkers, and he listened with much interest to Arthur Copp's history of each of these individuals.

Many more stops were made en route back to the planet Mars and many noted telegraph men were gathered into the van, notably, James Bell, of Nevada; John Henderson, of Chicago; Ed. Sholes, Fred Benson, George and Joe Harris, of St. Paul; Ruby Sheldon, of Cleveland; Fred Catlin, Robert W. Chapman, George B. Simpson and Charles D. Burke, of Chicago.

Many songs were sung, everyone joining in singing "Where's My Wandering Boy Tonight?" and "Hail! the Conquering Hero Comes," until the long journey was at an end and they landed safely upon the planet Mars.

A big programme of entertainment had been prepared to welcome the loiterers to their new resting place and a special bulletin of the two days' proceedings was prepared by Secretary Fred B. Moxon to be transmitted to his terrestrial partner, who would then disseminate the same through the columns of TELEGRAPH AND TELEPHONE AGE to all parts of the earthly globe.

A movement was now on foot to have an exodus from Mars to Jupiter, and this proposition was being much canvassed, particularly by the real old-timers on Mars.

General George Washington, Napoleon Bonaparte, Lord Wellington, William Shakespeare, Christopher Columbus, Americus Vespucius, Abraham Lincoln and many other leaders while on earth had manifested their disposition in favor of making the trip, all realizing, however, that there was no comeback.

"We understand," said Ralph Waldo Emerson, "that we are in God's kingdom, and that we will be as safe up there in Jupiter as we are right here on Mars, and the thought of God's omnipresence, should remove doubt and fear from every heart."

Much interest, but no anxiety was felt for the members who were determined to proceed, yet there were many who desired to await the arrival of some particular dear one from earth and those decided they had "better bide-a-wee."

Preparations for this hegira are now going on and will be chronicled in these columns at some later date.

(To be continued)

The following list of Canadian operators who lived, flourished and passed away, either in this country or in Canada, has been furnished by a Canadian Pacific Telegraph official, with the suggestion that they be admitted into the sacred precincts of the Pleiades Club. The list embraces some well known and revered names:

Sam Garvey, Manager Dominion Telegraph Company, Montreal, in the seventies; S. E. Gibbs, chief operator at Toronto, Dominion Telegraph Company in the seventies; Jim Ingram, of Ogdensburg, N. Y., manager for a number of years of the Montreal Telegraph Company there, succeeding John Henderson in the early seventies; John Murray, manager of the Montreal Telegraph Company at Brockville, Ont., in the seventies and later in charge of the District Telegraph Company at Montreal; Alexander McNaughton, of the old Montreal Telegraph force in the seventies and eighties; Larry Longmore of the same company and of the same time; James Dakers, secretary of the old Montreal Company, whose presence in the operating room was a constant lesson in the virtue of economy; Alexander Grant, superintendent of the Montreal Company, a fine man and greatly respected; Thomas Elwood, superintendent of the Dominion Telegraph Company at Toronto, a fine operator and a man beloved by all who knew him; P. Snyder, an old Dominion star and in later life superintendent of the Canadian Pacific Railway Company's Telegraph at St. John, N. B.; Hiram Pingle, who made his reputation at the House of Commons in the seventies as a very fast sender, later superintendent of the Canadian Pacific Railroad at Toronto; A. W. Barber succeeded Pingle as superintendent at Toronto and he, too, some years ago, went over to the silent majority; Jonas Oliver, well known in western Canada around 1890 to 1905, a self-educated Icelander, fine operator ("Little Skratti Icelandic" was his nickname): David J. Duff, one of best known of the younger generation of Canadian operators, died 1905, at Winnipeg, aged twenty-eight; was a great favorite, not only in his native city of Winnipeg, but in

Chicago, where he had worked for several years, in Philadelphia, New York and at Palm Beach, Fla. [Several other names of Canadian operators who have passed away will be printed in next issue.]

Denver Postal.

There are many delightful cities in this favored country of ours, and many places to sojourn where a person grows old almost without being aware of the fact.

Denver is the Queen City of the mountains and the seductiveness of her climate and the wholeheartedness of her people have enticed many a visitor to make a stay and to live and die within sight of Pike's hoary peak.

It was from this city that such national characters as Thomas W. Carroll, Belvidere Brooks, W. N. Fashbaugh, Chas. Fisher and John E. Jenkins took their first inspiration in telegraph matters, later reaching the heights of their heart's desire.

Here it was that Benj. F. Woodward, S. T. Armstrong, Benj. Bates, James Hard, Jas. C. De Long and George Lawton lived and flourished in the olden days, making room later for the "Johnnie come lately."

Superintendent W. C. Black has been in the telegraph business a number of years, many of which have been given to the service of the Postal. Mr. Black imbibed the true spirit of the Postal Company as inculcated by the late John W. Mackay and the same spirit is infectious, extending to the entire Denver force, as well as to the offices under Mr. Black's superintendency.

In the operating department, C. H. Jett is chief operator, a gentleman qualified by electrical education and experience for the position. Mr. Jett is known in the mountain zone for his manliness. He is ably assisted during the day by that sterling old-timer, M. J. Gorman, who is wire chief and well conversant with the duties of his position.

The night chief operator, H. J. Keeley, learned the business in the Postal office at West Chester, Pa., under Thomas M. Smith, manager, and began working a wire in Philadelphia when he was but thirteen years old, incidentally acting as relief manager for Lee Lemon, then superintendent, removing to Denver two years later. He has worked in this office for seven years, rising to his present position of night chief about a year ago at the age of twenty-two. Mr. Keeley conducts the affairs of the office with the ease and grace of an old-timer, and is as ready to serve his country at the front as he is to conduct the affairs of his position, realizing that it is just a matter of duty.

The late night chief is H. W. Knowles.

The monitors are: Days, A. D. Blake; nights, Edward Keeley.

Chief Operator Jett, with commendable enterprise, has taught most of the operators in his office the mysteries of the wire game, thus rendering their services of more value to the company.

Positions in this office are eagerly sought after by the craft, who know that it is good to be here.

The Denver Postal has given to Uncle Sam some of its best blood for the noble cause.

In Mr. Black's office are the Misses Grace Arnold, cashier; Grace Correo, chief clerk—two ladies well equipped to do the company good service—and Miss Simon, stenographer.

C. B. Quick is the genial assistant manager.

The operators—and there are many stars of the first magnitude among the number—are: James H. Cronin, E. T. Whitbread, J. B. Oberlander, Roy Nelson, Jesse Mitchell, Hobart C. Davis, Frank Gargan, James B. Letts, Ed. Locey of national fame, Harry Graham, Fred Peters, Mrs. Mable Davies, Mrs. Anna Stockton, Richard Shrewsbury, G. G. Nordmark, J. G. Stack, W. R. Deacon, R. G. Parker, A. S. Helgason, Orville C. Secrist, J. W. Gargan, William Kiley, Ray Virden, Thomas A. Smith, and Walter P. Keeley, brother of night chief H. J. Keeley.

Wilbur T. Ellis, for many years night chief operator here for the Postal, has accepted a position with Otis and Company, brokers, at Casper, Wyo.

Chicago Western Union.

John McRobie, one of the most widely known and highly respected telegraph men in the country, is visiting Chicago and will probably locate here permanently, as his wife's health is very poor in California.

Henry E. Cullen, a promising young electrician, is taking the place of B. M. Gosselin, equipment chief, while the latter is away on a vacation.

Martin J. Mullin, night chief delivery clerk of this office, has been with the company for more than thirty-four years and has filled positions in the delivery department uninterruptedly during this period. Mr. Mullin is the office wit and humor flows from him in a never ceasing stream. His thorough knowledge of the city and his attention to business render him a valuable man to the company.

A. J. Fuller, day force chief of this office, has his desk on the tenth floor. Mr. Fuller has been with the company in Chicago since 1888 and has satisfactorily filled many positions of trust. His ideas of a square deal make him popular with the members of his force.

LETTERS FROM OUR AGENTS.

New York Postal.

T. V. Flynn has been appointed agent for the Telegraph and Telephone Life Insurance Association in this office, vice H. T. Marks, resigned.

Assistant chief operator Thomas H. Tierney is enjoying his annual vacation at Nantucket, Mass. Mr. Tierney was the subject of an interesting article in a recent number of the *Railroad Man's Magazine* as the pioneer American wireless operator.

Wire chiefs J. A. McNulty, W. J. Kavanagh and A. J. Ward and traffic chief R. E. Walsh have returned from vacations.

Operator J. E. Hoey, Jr., who has been helping on the quads for some time, was called out in the mobilization of the National Guard. He is a member of the Signal Corps. A number of other young men in the operating department have also answered the call to the colors.

Chief operator Everett Hamlin, of the 75 Madison Avenue office, and operator Thomas Logan have been called away with the Signal Corps. Both have been members for some time.

Quite a number of branch office employes are subscribing for shares in the Serial Building Loan and Savings Institution since the benefits of that institution have been brought to their attention.

Joseph J. McCauley, connected with the office of the city manager and a first lieutenant in the Signal Reserve, has been called to the service and is now at Monmouth, N. J., with his corps.

The government, through the Navy Department, has arranged to take over and swear into the service all employes of the marine stations of this company at Fire Island, Sandy Hook, Highlands and Quarantine. The men at those stations, when sworn in to the government service, will bear titles with rates of pay which will be about equal to the positions they held with the telegraph company. At Sandy Hook Manager W. H. Murray is now Gunner Murray and operators E. D. Bunno and J. J. O'Neill are rated as chief electricians.

New York Western Union.

J. E. Hall, identified with the Richmond, Va., office of this company for the past thirty years, was a recent New York visitor while on vacation. Mr. Hall made it the occasion to call on numerous old friends.

Lieutenant P. J. Tierney, of the Navy Department, has charge of the cable censor's office at 8 Broad Street. Lieutenant Tierney is one of the best known men of the telegraph profession, and his wide experience in cable affairs eminently qualifies him for the duties of his position.

At a meeting of broker telegraphers in New York recently, names of many men eligible for the Signal Corps Reserve were presented to Major Henry G. Opdycke, recruiting officer, for immediate enlistment. The names of several hundred others who are above the age limit or have dependents were volunteered for extra service, in addition to their brokerage duties, with press and commercial companies. This action was taken to release immediately the large number of men eligible for government work, so that the companies might be crippled as little as possible.

Thirty-eight members of the main office force have responded to President Wilson's first call and have joined the colors.

The Western Union Educational Society Baseball League is holding games every Sunday at the Parade Grounds, Brooklyn. On July 8 the Service Department team defeated the Bookkeeping Department by a score of 10 to 3. On the same day the Multiplex Department defeated the Commercial News Department also by a score of 10 to 3. On July 22 the Commercial News Department defeated the Service Department by a score of 8 to 3.

On Friday evening, July 27, a considerable number of the employes visited Luna Park, Coney Island, where an entertainment was had for the benefit of the Baseball League of the Western Union Educational Society.

During the month of May some high averages were made by Morse and multiplex operators as follows: Morse operators—Mrs. P. Taylor, 78 messages per hour; A. Montequin, 72; W. C. Smith, 70; Miss E. Conroy, 65; A. H. McDowell, 65; Miss M. F. Regan, 64; H. McComb, 62. Multiplex perforator operators—Miss M. Erbe, 61; Miss C. Sheridan, 58; Miss V. Sundstrom, 55; Miss S. Karten, 52; Miss M. D. Neil, 51.

All employes of the marine stations at the New York main office, Quarantine, Sandy Hook, Highlands, N. J., and Fire Island have enlisted in the Naval Reserve. The men will have an official rating corresponding with the salaries paid them by the company. Naval Reserve officials say that they will ultimately call all these men into active service and practically take over the entire marine reporting work. The intention is to permit the Western Union to have the news as formerly, but it will be censored by the Navy Department by order of the government. The marine service is now confined to the Maritime Exchange, the owners or agents of steamships and any government department, such as the custom house, post office, etc. Marine news can no longer be furnished to newspapers, hotels, railroad or express companies or to the general public as heretofore.

On Sunday evening, July 23, a dinner was tendered by employes of the Central Cable office, New York, to members of its staff who have been called to join their different regiments. About one hundred and twenty-five were present. After dinner, during which the diners were entertained by the Central Cable office orchestra, a capital vaudevllle entertainment was given by home talent. Following are the names of the men who have been called to the colors: Raymond Tierney, August Lombardi, Frank H. Moore, Ivan Broberg, James Smith, Thomas Newton and Edward Comans.

Boston Western Union.

Daniel Carter has been appointed supervisor of the eastern ways, and E. E. Fischer has been appointed supervisor of the way wires in the annex.

The offices of Plant Superintendent W. S. Barker have been moved to the top floor of the building, Morse and multiplex schools being assigned the quarters vacated on the second floor.

District Cable Manager Lister is delivering a series of lectures to the students of the multiplex and Morse schools, giving instructions in the proper handling of cable messages.

Repeater Attendant W. T. Budds has returned from Savannah, Ga., whence he was called by the illness of his brother. Mr. Budds' son, W. P. Budds, an operator in the main office, has joined the colors and is stationed at Provincetown, Mass., in the Signal Corps.

Night Senior Supervisor T. J. Young, absent on account of illness, is being relieved by J. P. Diggins, of the day force, while Assistant Wire Chief A. C. Dunn is filling Mr. Diggins' place.

Operator T. E. Doherty has been transferred to the Commercial News Department, being relieved on the Worcester premium circuit by A. B. Kurtz.

More than 300 members of the Western Union Associates, composed of employes of the company in the Metropolitan district, attended the first annual outing and field day of the association at Newton, Mass., July 21. Representatives of every department were present. J. A. Molloy was in charge of the outing, assisted by Grace T. Farrell, T. J. McCaffery, H. J. Coughlan, Vivian Flynn, Irene Casey, L. J. Dennett, Alvira A. Newhall, J. H. Grinsell, H. Claire Delorey, E. E. Foerster, Laura Harloy and Arnold Meyers. The 100-yard dash was won by O. L. Totman; R. Burke, second. Three-legged race—won by Camp and Durianne; Vitalli and Barrows, second. Girls' egg and spoon race—won by Elizabeth Lewis; M. A. White, second. Girls' 50-yard dash—won by Esther Parkhurst; Hattie Grulm, second. Messengers' 100-yard dash—won by H. Prasse; Israel Kushner, second. 100-yard swim—won by Israel Kushner; John Koenig, second.

Denver Western Union.

The new arrivals in the Denver Morse department are: Miss Nellie Peterson, late of the Santa Fe Railroad at Pueblo, Col.; L. H. Graves, H. R. Green, formerly with the commercial department at Golden, Col.; M. C. Loomis, transferred from San Francisco; E. W. Young, transferred from Davenport, Iowa; N. J. Anderson, of Chicago; A. G. Colburn, of Detroit; P. E. Farman, transferred from Omaha; R. W. Conn has returned from the commercial department; Miss C. E. Smith has returned from Wichita and is now in the Morse department; C. A. Morse transferred from San Antonio, Tex. E. W. Young and K. S. Jones were sent to Fort Riley, Kan., to help out on heavy war business, temporarily.

H. G. Ladroot and Paul E. Hill have resigned, we understand, to accept positions with the telephone company.

In the multiplex department, Miss Edith Crane has been promoted to supervisor. The multiplex students promoted to regular positions this month are: Misses Mason, Kiester, and Barbieri, and Leo Wilson.

Miss Violet Longfellow has returned from Wichita, where she has been teaching Morkrum students.

In the telephone department, Mr. George Smales has been promoted to night supervisor; Miss Grace Shanley was recently transferred to the telephone department in Pueblo; Miss Ela Anderson has been transferred to the Colorado Springs telephone department. Miss Lurley Wentworth, late of this department, has joined the matrimonial class, and Miss Lola Hollister, late of Colorado Springs, has resigned.

Arthur Reade has gone to the aid of his country. Miss Elizabeth Fowler has accepted a position at the Colorado Hotel in Glenwood Springs.

Philadelphia Postal.

The vacation season is with us once more and the continuous warm spell has caused many of our employes to seek relief at the seashore and other nearby resorts.

Among those who have returned from their vacations are Miss E. Brobst, of our telephone department, and District Foreman J. R. Gorsuch, who spent his vacation covering the Postal lines on general inspection.

Office Electrician A. G. Carpenter is busy doing extensive repairs at our Easton, Pa., office.

H. P. Price, of our cable department, has returned from Chester, Pa., where he has been making extensive cable repairs.

Former Manager Ralph Barton, of Lancaster, Pa., met with a serious accident some time ago in an automobile smash. His friends wish him a speedy recovery.

Operator N. M. Moon, of the Wilmington, Del., office, died suddenly on July 17. He was employed with the Postal for a number of years.

Edward A. Burns, a well known telegrapher to Philadelphians fifteen years ago, died on July 23.

C. J. Stack is now looking after our interests at Shenandoah, Pa. He succeeds T. A. Reilly, who has resigned to enter another business.

Miss Hannah Conway, of our telephone department for a number of years, has resigned to accept a position with Robert Beatty and Company, dealers in yarns and woolens in this city. Miss Conway has the best wishes of the entire operating department upon her new enterprise.

Telegraph and Radio Operators, Electricians and Linemen, wanted for Signal Corps, U. S. Army. Pay ranges, according to rank and service, home or foreign, from $15 to $90 a month, and in addition rations, quarters, clothing and medical attendance are furnished. Signal Corps offers unusual opportunities for foreign service and rapid promotion to young men of character, intelligence and ability, who have had electrical training, particularly as telegraph or radio operators. For detailed information write to Chief Signal Officer, U. S. Army, Washington, D. C.

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33d YEAR

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Telephone Building, 24 Walker Street, Room 1129. Daily 9 a. m. to 2 p. m.

Saturdays 1 p. m.

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NEW YORK, AUGUST 16, 1917.

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Death of a Notable Old-Timer.

In the death of J. N. Worl at Plainfield, N. J., on July 31, a remarkable career was brought to a close. The deceased was granted by Congress in 1866 exclusive cable landing rights on the Atlantic Coast and to him the French Cable Company and the Direct United States Cable Company had to pay over a large sum of money for the privilege of landing their cables on the American continent. One million dollars was raised by a French syndicate to purchase the franchise from Mr. Worl and the check for that amount was placed on deposit in a French bank awaiting transfer when disaster overtook the bank; it failed and Mr. Worl and his brother, who was also interested in the enterprise, were left heavily in debt.

Mr. Worl died a poor man, after engaging in various lines of activity following his great loss. His life was an illustration of the uncertainty of things in this world. One day he was immensely wealthy and the next day penniless. Such a shock is enough to stagger anyone, and most men would have succumbed under such a strain, but Mr. Worl had the courage to rise above his misfortune and lived to the ripe old age of eighty-three years.

Mr. Worl was a forty-niner of the telegraph, and during his telegraph career in the Civil War period had some unpleasant experiences that were, however, softened by an apology from the United States government.

Rebellion Against a Police Signal System.

The police force of Maysville, Ky., received a distinct shock recently when a telephone police signal system was installed. The unfeeling city fathers required each policeman to report to headquarters every hour by the new system, but rather than do this and lose their sleep and other enjoyments, six of the seven guardians of the peace quit the service.

Some one in Maysville must have had courage to attack old-fogyism in the administration of the town's affairs, but modern ideas are irresistible once they get in motion.

As to Telegraph Schools for Women.

Our editorial reference in the August 1 issue to the misleading statements published in newspapers as to the possibility of becoming first class operators after three months' instruction has attracted much attention. It of course related to wire operators. Wireless operators can be turned out in much less time than wire operators, but the greater demand today is for operators of the latter class, and the facts involved should be carefully explained to students at the beginning of their course.

Many students in wire telegraphy, when they find that after three months' practice they have not reached the first class grade, frequently become discouraged, but there is no good reason for giving up, because, on the whole, they are probably up to the average in experience, and if they will keep at their work long enough they will likely succeed.

In learning telegraphy, success depends upon the individual capacity to learn and not upon the mechanics employed. The days of the irresponsible telegraph school fortunately are past and those that now exist are worthy of respect and consideration, especially wireless schools. They, as a rule, are promoted and supported by large interests and have the welfare of their students at heart.

Young women make first class operators, as well as do men, and have as great opportunity to reach the top, both in wire and wireless work, and many of them shine in their profession. The existing wireless schools are complete in their appointments and methods, and are doing excellent work, and those students who take up this instruction have every reason to be sanguine as to results. The managers of these schools are wholly competent and have the best technical and advisory counsel obtainable, and the schools are graduating efficient radio operators.

We are heartily in accord with every means for turning out operators of the best grade, for the country now needs all it can get, but we do frown upon misleading statements in the daily press as to the possibility of doing impossible things.

Telegraph and Telephone Patents.

ISSUED JULY 10.

1,232,497. Telephone Exchange System. To H. P. Clausen, New York.

1,232,498. Automatic Testing System. To H. P. Clausen, New York.

1,232,507. Telephone Exchange System. To H. L. Darrah, New York.

1,232,548. Device for Coupling a Telegraph Transmitter and Sending Key. To C. M. Holmes, Jacksonville, Fla.

1,232,580. Selective Controlling System. To A. E. Lundell, New York.

1,232,581. Substation Telephone Set. To A. E. Lundell, New York.

1,232,582. Automatic Telephone System. To A. E. Lundell, New York.

1,232,879. Thermionic Amplifying Circuit. To P. I. Wold, New York.

1,232,884. Operator's Telephone Circuit. To O. E. Benson, New York.

1,232,891. Telephone Meter or Register for Measuring Telephone Calls. To G. L. Bruschke, Chicago, Ill.

1,232,943. Telephone Exchange System. To A. E. Lundell, New York.

1,232,944. Telephone Signaling System. To A. E. Lundell, New York.

1,233,037. Fire Alarm System for Telephone Exchanges Using Line Distributors. To D. G. Gee, Rochester, N. Y.

1,233,196. Automatic Ringing and Secret Service Telephone System. To H. D. Currier, Chicago, Ill.

1,233,211. Device for Telegraphing Under Water. To F. P. Fisher and H. Dehart, Radford, Va.

ISSUED JULY 17.

1,233,519. Telegraphy. To G. O. Squier, Mayfair, London, England.

1,233,620. Telephone Call Registering Device. To V. Thompson, Vancouver, B. C., Canada.

1,233,766, 1,233,767 and 1,233,769. Duplex Circuit. To L. Espenscheid, New York.

1,233,768. Inductance Device. To L. Espenscheid, New York.

1,233,744. Telegraph Key. To M. N. Givinn, Meadow Creek, W. Va.

1,233,819. Automatic Telephone Exchange System. To A. B. Sperry, New York.

1,233,830. Telephone Exchange System. To J. L. Wright, New York.

1,233,831. Selector Switch. To A. H. Adams and A. E. Lundell, New York.

1,233,837. Telephone Exchange System. To J. D. Bonnar, Cleveland, Ohio.

1,233,841. Means for Receiving Electrical Oscillations. To E. E. Bucher, New York.

1,233,870. Automatic Telephone System. To C. L. Goodrum, New York.

1,233,891. Automatic Telephone System. To A. E. Lundell, New York.

1,233,892. Semi-automatic Telephone System. To A. E. Lundell, New York.

1,233,893 and 1,233,894. Telephone Exchange System. To A. E. Lundell New York.

1,233,940. Telephone Exchange System. To H. G. Webster, Cleveland, Ohio.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on August 13:

American Tel. and Tel. Co.	119½
Mackay Companies	78½-80
Mackay Companies, pfd.	64-64½
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2½
Western Union	93¼

PERSONAL.

Brigadier-General George O. Squier, chief signal officer of the army, has recently been made a fellow of the Royal Society of England in recognition of his invention of a new system of ocean cabling.

Mr. Samuel W. Beach, chief operator, of the Navy Department telegraph office, Washington, D. C., was a New York City visitor last week. Mr. Beach is an old-time telegrapher and a well known author. He served several years in th Philippines for the government.

Mr. M. A. Noss, of the Western Union at New Haven, Conn., and his interesting daughter, Geraldine, are spending a month at Oak Bluffs, Mass., the guest of Walter P. Phillips. Mr. Noss was associated with Mr. Phillips in the former United Press, twenty years ago, and the restoration of the old time personal intimacy is the source of unalloyed pleasure to both.

The Telegraph in Germany.—Berlin seems to be much concerned over the congestion of messages and press dispatches on the wires, a large proportion of which is reserved for military purposes. Twenty thousand more messages are now handled daily than in the period just prior to the beginning of the war.

Electricity Still Holds the Record.—An automobile ran 1,898 miles in twenty-four hours on the Sheepshead Bay racecourse on August 1 and 2, which was at the rate of 79.083 miles per hour, including stops.

The interest of mankind is peculiarly attracted by examples of signal goodness in high places; for that testimony to the worth of goodness is the most striking which is borne by those to whom all the means and pleasure and self-indulgence lie open.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. M. M. Davis, electrical engineer, New York, is taking his annual rest at Cape Cod, Mass.

Mr. J. F. Skirrow, associate electrical engineer, has returned to his desk after a vacation at Wanamassa, a suburb of Asbury Park, N. J.

Mr. W. B. Dunn, assistant secretary of this company, is taking his annual holiday at Saguenay Park, Ont.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Mr. T. W. Carroll, general manager of the Eastern Division, New York, has returned to his desk after a business trip to Baltimore and Washington last week. Previous to that time Mr. Carroll made an extended tour through the New England States on business connected with the service.

Mr. E. Y. Gallaher, vice-president, accounting department, New York, is passing a few days at Jefferson, N. H.

Mr. A. F. Burleigh, secretary of this company, is spending his vacation in Alderson, W. Va.

Mr. S. L. Burts, division traffic superintendent, Atlanta, Ga., was a recent New York business visitor.

Mr. Frank Kitton, of the office of the vice-president of plant, has returned from his vacation, which was spent in the Pocono Mountains, Pa.

Mr. Frank D. Giles, until recently chairman of the Western Union pension fund, New York, now on an extended leave of absence which he is spending in automobiling from New York to Los Angeles, Cal., has reached Ogden, Utah, where he will remain some time with friends before proceeding on his journey. The trip so far has very materially benefited his health.

Transformation of a Great Business.

A recent number of the Dallas (Tex.) *Morning News* contained an interesting and well written article under the title "Transformation of a Great Business," in which the modern organization of the Western Union Telegraph Company in the Gulf Division was fully described. The pull-together spirit in the organization was the central idea of the story, and General Manager S. M. English, of Dallas, gave much interesting information about the work of the company in that division and the methods employed.

The article was well illustrated with views of the Dallas operating department and of a complete multiplex equipment, besides the portraits of many of the high officials of the Gulf Division. These included S. M. English, general manager; W. H. Schroeder and F. H. Austin, assistants to the general manager; S. Green, division auditor; B. P. Hancock, division traffic superintendent; H. McCann, division supervisor of lines; H. R. Monahan, division equipment supervisor; C. B. Straughn, division valuation engineer; J. G. Hilbert, division plant superintendent, and F. R. Kirby, division superintendent of supplies.

"The Dallas office of the Western Union," says the article, "ranks twenty-fifth in the United States from a standpoint of revenue, but fifth in volume of telegrams handled, this being explained by the fact that Dallas is a very large relay point. The Dallas operating room, where at present there are 353 employes, is also very proud of the fact that it ranks third among all the operating rooms in the country in Liberty Bond subscriptions—the total subscribed having been $28,100."

THE CABLE.

Mr. John Goldhammer, assistant secretary of the Commercial Cable Company, has been given the additional title of general executive assistant. In this capacity he will continue to act, as he has for some years past, as assistant to Vice-President and General Manager George G. Ward.

Removal.—To secure more space, the office of Mr. J. J. Welch, assistant traffic manager for America, Western Union Cable System, has been moved from 195 Broadway to 62 Broadway, New York.

Cable Interruption.—Communication with the Philippines and China, including Hongkong, via the Commercial Pacific Cable from San Francisco has been interrupted. Cablegrams can be forwarded only via Europe.

Aurora Affects Cables. — On the night of August 9 the aurora earth currents were so heavy that they burnt out two 50-ohm outgoers at the Bay Roberts, N. F., cable station of the Western Union Cable System. The aurora was the heaviest experienced in years and affected all of the Atlantic cables, seriously interrupting traffic.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to August 10 as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable) October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31; Paramaribo and Cayenne, July 28, and Guam and Manila, August 5, 1917.

CANADIAN NOTES.

CANADIAN PACIFIC.

Capt. Fred H. Bowen, medical officer of the Royal Flying Corps, is on leave of absence. He was wounded at the Somme, but recovered and resumed duty. In addition to his medical qualifications he is an expert aviator. He is a son of D. H. Bowen, Canadian Pacific Railway Company's Telegraph, Sudbury, Ont., and was an expert telegrapher before becoming a doctor.

The following are also in overseas service: Lieut. Dan Bowen, another son of Mr. Bowen, is in the Records Office, London, having been wounded at the third battle at Ypres; Ethelbert Young, son of R. N. Young, superintendent Canadian Pacific

Railway Company's Telegraph, Vancouver, B. C., who is a crack shot; two sons of B. S. Jenkins, Winnipeg, Man., retired general superintendent Western Lines; besides two sons of W. J. Camp, assistant manager Canadian Pacific Railway Company's Telegraph, Montreal. Over 375 operators, clerks, etc., of the Canadian Pacific Railway Company's Telegraph service have enlisted.

THE TELEPHONE.

Dr. F. L. Devereux, auditor of the Long Distance Lines Department of the American Telephone and Telegraph Company, New York, was recently the recipient of the degree of doctor of philosophy from his *alma mater*, Georgetown University, Washington, D. C.

Mr. H. E. Merkel, formerly with the Western Union Telegraph Company, but lately with Swift and Company's telegraph department, is now with the American Telephone and Telegraph Company, New York, as Morse board man and repeater operator.

Mr. C. A. Gates, former general manager, with headquarters at Dallas, Tex., has been appointed vice-president of The Southwestern Telegraph and Telephone Company (New York), and is succeeded by A. B. Elias. Mr. W. F. Schregardus has been appointed general plant superintendent to succeed Mr. Elias at Dallas.

Change of Name.—The name of the Pioneer Telephone and Telegraph Company, a constituent of the southwestern group of the Bell System, has been changed to Southwestern Bell Telephone Company (an Oklahoma corporation).

Foreign Languages on Telephone Prohibited.—Conversations over the telephone in England in the languages of enemy states is prohibited.

Mr. Vail President Ten Years.

Mr. Theo. N. Vail, ten years ago (April 30, 1917) was elected president of the American Telephone and Telegraph Company. To mark the event a number of old friends and associates recently presented him with a handsome medal.

Mr. Vail commenced his official connection with the Bell telephone interests in 1878 and, although he was not continuously officially connected with the system up to the time of his election as president, his interest in the development of the company never flagged.

Rio Janeiro's Peak Load.

The peak load of the Rio Janeiro, Brazil, telephone service is between 3 and 4 p. m., and is caused by the Brazilian lottery. The drawings take place about 2:55 p. m. and the ticket holders call the lottery houses, of which there are hundreds, to obtain the lucky number.

Telephone Service.

Service is satisfaction, and a satisfactory telephone conversation is possible only by a well constructed plant, plus good operating, says *The Transmitter*. Bell service must be, above all else, prompt and accurate; the company assumes that every telephone message is important and urgent.

The operator has no way of telling, when the little light glows, whether the call to follow is an emergency call or just an ordinary business call or even a frivolous chat between a couple of schoolgirls. But she assumes that the call is really important and handles all calls on that basis. This is what makes telephone service what it is, and a highly trained and well disciplined force is constantly giving the service intelligent attention.

Japanese Superstitions and the Telephone.

The Japanese, like many Americans, believe there is luck in certain numbers, and are willing to go to great lengths to gain the protection of these lucky symbols.

A single figure telephone in Tokio sells for from 800 to 1,000 yen ($390 to $490) a year. The luckiest number in the estimation of business is eight, because the character for it spreads downward and suggests the idea of gathering prosperity.

Number 753 is also believed to be a lucky number, because children are presented at Shinto shrines on their third, fifth and seventh birthdays. Indeed, odd numbers are lucky. Three-figure numbers are not objectionable, if they are as easy to remember as 123 or 555.

The most unlucky numbers are 42 and 49, because the former may be pronounced "shini" which means "to die," and the latter may be pronounced "shiku," which means "death" and "suffering." Therefore, it is said that those numbers are avoided by individuals and are generally taken by government officers, schools, police stations, and other invincible institutions.

The British Telephone Service.

The British Post Office in its many departments has lost 75,000 of its employes, most of them highly skilled and specialized workers, by reason of enlistment in the army, and while their places have been filled by less experienced and capable workers, many who volunteered and went to France have had to be recalled.

Telephone service especially has been the sufferer. It is impossible to find men capable of installing telephones, with the result that the minimum time in which a subscriber can have a telephone installed is from six months to one year. It was stated that one curious result of this condition is the difficulty which people encounter when they propose to change their business locations or residences. A London correspondent in the New York *Sun* says: "It is notorious everywhere that the telephone once installed promptly becomes an absolute necessity. The household or business establishment that gets along without a telephone may continue to do so; but one that has used the service never again is able to do without it."

Consequently when an Englishman wants to move he first finds out whether there is a telephone already installed in the new location; if no telephone, then no move.

Use the Telephone Directory.

The telephone company wants subscribers to use the telephone directory in making calls and to call by number only. Private lists of numbers are discouraged because they frequently contain errors. Subscribers are requested not to call from memory because memory plays strange tricks.

Suppose the man who calls from memory wants to get in touch with a business friend. The number he calls sounds something like the one he wants, but it is that of a telephone located in a residence. It is on the first floor. The operator rings the bell. The woman of the house, who happens to be upstairs at the time, rushes downstairs to answer the summons. She announces herself and the voice on the other end of the line says "Wrong number!" and somebody hangs up a receiver. The housewife mutters something about stupid operators and goes back upstairs. The caller realizes his guilt and hurriedly looks up the right number. Then he says to the operator, "You gave me the wrong number; I want 2121." Do you wonder why the company asks its patrons to consult the telephone directory?—*The Transmitter.*

Progress in Telephony.

The Bell System maintains an engineering and scientific staff of more than 550 specialists, says the *Telephone Review,* among them former professors and instructors of universities, postgraduate students, and other graduates holding various engineering and scientific degrees from seventy different scientific schools and universities, sixty American and ten foreign institutions of learning being represented.

This research and experimental department of the Bell System has produced results which far exceed anything which has been accomplished in any other country in the world, such as long distance telephony by which the Atlantic and Pacific have been connected over a stretch of 3,400 miles of telephone wire, wireless telephony, by which speech transmitted into a telephone in Washington was heard simultaneously in Honolulu and Paris without wires, the existing underground cables extending from Washington to New York and thence to Boston, which are of the most recent date and represent most extraordinary advances in the art. A further achievement is recorded by which the laying of a new cable between Washington, New York and Boston is made possible, notwithstanding the difficulties in obtaining raw material.

The Telephone "Doing Its Bit."*

BY W. N. FURTHMAN.

Dispatches from all of the war fronts of the nations engaged in the great conflict furnish convincing evidence that the telephone is certainly "doing its bit." While the telephone was expected by engineers to do its share, the ordinary soldier in the trenches probably had no idea what a vital part of the war the telephone would become. In open field maneuvers it has always taken a definite and prescribed place, and come to be considered indispensable by signal officers everywhere.

Modern war, as illustrated in the great conflict, has brought about many further uses and opportunities for greater application of the telephone. Most of the old equipment has been relegated to the function of a mere accessory in the new field that has thus suddenly been brought into existence. A very few technical war experts predicted trench warfare as we now know it, but even they did not foresee that it would almost monopolize all fronts of the conflict.

Detail descriptions of trench warfare and the illustrations accompanying them show very clearly that veritable small towns are built underground. That necessity for providing all of the requirements of the soldiers, not only for winter but also for the other seasons of the year, is readily apparent. In a great many instances, especially on the western front in France, the inhabitants of villages, towns and even cities have developed almost permanent underground means of existence. A condition of this kind would make the use of a telephone indispensable with war in the immediate vicinity. Communication over any distance would be almost impossible without it.

The more recent dispatches from the front have stated that it is the practice in using the telephone to revert to the old system of ground return. They also describe the elaborate switchboard systems that are installed at advantageous locations and the large number of calls and orders that are transmitted for almost every conceivable purpose. By means of certain equipment not described the Germans are able to detect and decipher telephone messages sent over wires within 500 feet of their lines. This is possible only because the earth is used for a common return.

Other dispatches have pointed out the advantages to either side of locating the telephone switchboards and by sudden dashes capturing them. In this manner it is possible to obtain valuable information by acting as an operator for the enemy. It is said such an operator has so acted for hours before being finally detected.

It is clear, therefore, that in addition to efficiency, secrecy is a great asset in telephone war service.

It immediately occurs then that a suitable automatic system would be the most desirable. The automatic system would, of course, require a metallic circuit, but as pointed out this expense would be justified as a matter of secrecy. The automatic system would not require an operator. It would thus be impossible in capturing an automatic system to compel the attention to answer calls of his officers.

AURORA BOREALIS interrupted the telegraph service in a fitful manner over the northern half of the United States and Canada, on August 9. The disturbance was more widespread than for many years.

SHADOWS.—The darkest shadows of life are those which a man himself makes when he stands in his own light.

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*Telephone Engineer.

RADIO TELEGRAPHY.

Signor Marconi has arrived at Rome, Italy, after his recent visit to the United States. He will report to King Victor Emmanuel the results of his trip.

Wireless in Brazil.—A decree has been issued by the Brazilian Government, declaring that the wireless telegraph and wireless telephone institutions in the country are exclusively the property of the Federal Government.

Transatlantic Wireless Service Discontinued.

Transatlantic wireless service between Canada and Ireland was discontinued on August 4 by the English Marconi Wireless Telegraph Company, by order of the British Government, apparently as a military necessity.

English Marconi Company's Statement.

The annual statement of the Marconi Wireless Telegraph Company, Ltd., of London, has been made up and shows an extremely favorable year for the company.

The summary shows that the net profit for the year 1916 amounted to $1,590,000, and at a general meeting of the company held on August 9 the directors recommended a final dividend of 10 per cent. on the ordinary shares and 5 per cent on the preference shares. This makes a payment for the year of 15 per cent. on the ordinary shares and 10 per cent on the preference shares.

The directors also recommend that the sum of $160,000 be placed in the general reserve and $1,900,000 carried forward in the profit and loss account.

This statement, which does not include the claim of the English company against the British Government, is considered highly satisfactory under existing and war conditions.

Code Test.

Recently Mr. E. C. Hargrave, of Bay City, Mich., the inventor of a simple and useful telegraphic code, sent forty telegrams in his own and other cipher codes to friends in various parts of the country, over the lines of both telegraph companies, in order to compare the service of the two companies in handling this class of business. The most difficult words found in various codes were sent in messages handed in at branch offices in New York, necessitating the relaying of the messages at least twice before they reached their destination. Notwithstanding the difficulties thus imposed on the companies by sending such a large number of intricate code messages, the service proved to be very satisfactory. It was only necessary to ask for one or two repetitions of words.

Some idea of the tasks the telegraph companies had to perform may be gained from a few samples of the code words used in this test, as follows: Icqvi, icscr, ictce, arceo, arcyi, ewwle, iojyj, iotoe, iottj, ezhez, myjty, firyq, albanales, passadez, endocyst, asksubtag, asksudmas, anddugfan, antdamjam, antdamfun.

Military Telegraphers Offer to Help the Government.

In a letter to Secretary of War Newton D. Baker, President William Bender Wilson, of the Society of the United States Military Telegraph Corps, suggests that those members who have offered to render any service within their power to the government in its present crisis be enrolled as a special reserve corps, under the command of the president and secretary of the society.

In his reply Secretary Baker states that under the Defense Act of 1916 it would not be practicable to organize such a body, but that the spirit of patriotism shown by the members of the military telegraph corps is most gratifying and is deeply appreciated. He suggests that it would be a patriotic duty well done if the society, or its individual members, would encourage telegraphers to join the Signal Corps of the regular army or the Signal Reserve Corps. In a yet broader way they could join the telegraph ranks of the country and thus release men for service in the Signal Corps units with the combat forces.

New York Telegraphers Aid Society.

The statement of the New York Telegraphers Aid Society for the quarter ended June 6 is as follows:

Balance on hand March 6		$25,748.48
Receipts		1,381,15
Total		$27,129.63
DISBURSEMENTS.		
Death benefits	$200.00	
Sick benefits	1,417.00	
Expenses	235.34	
		1,852.34
Balance on hand June 6		25,277.29
Total		$27,129.63
RELIEF FUND.		
Balance on hand March 6		$6,219.43
Receipts		255.60
Total		$6,475.03
Disbursements		$193.00
Balance on hand June 6		6,282.03
Total		$6,475.03

Useful Book on Wireless.

"Operators' Wireless Telegraph and Telephone Hand-Book," by Victor H. Laughter, is a book that every wireless man should possess. It is a complete treatise on the construction and operation of the wireless telegraph and telephone, including the rules of naval stations, codes, abbreviations, etc., and is written in plain language and very thorough in its treatment of the subject. It has 172 pages and 86 illustrations. For sale by Telegraph and Telephone Age, 253 Broadway, New York. Price, $1.00 per copy.

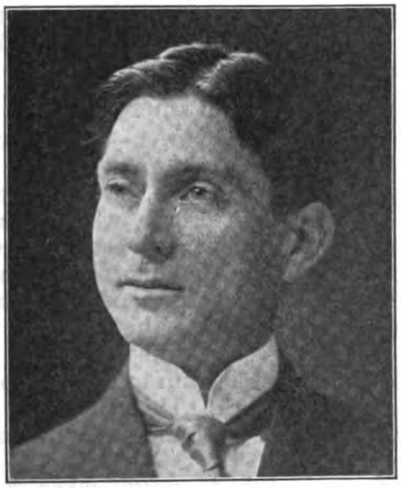
Ambushed in the Philippines.*

BY J. W. McMAHON, NEW YORK.

The country, and especially the army, lost a military genius, a strategist and a gentleman of humanitarian ideals, in the death of Major General Frederick Funston, which recently occurred at San Antonio, Tex. His death recalls to mind some thrilling adventures I had in the Philippines.

Between 1899 and 1902 it was my good fortune to serve under General Funston for nineteen consecutive months in the Province of Neuva Ecija, Island of Luzon. As a member of Company "F," United States Signal Corps, I was telegraph operator at Cabiao, a small town on the Rio Grande, six miles south of San Isidro, where Funston maintained brigade headquarters.

During the dry season at low water an armored quartermaster department launch plied between Calumpit, on the Manila-Dagupan Railroad (the only railway on Luzon at that time), and Cabiao, at which point army wagons drawn by four mules assembled under heavy guard to remove supplies to the northern interior. It was my duty to signal or report the arrival, condition and departure of these wagon trains, and on some occasions apprehension was felt for their safety, especially when their arrival was unusually delayed. We often found it necessary to send out reconnoitering parties to determine their location.



J. W. McMAHON.

The arrival of these wagons always aroused interest in camp; they carried the mail in addition to commissary, ammunition and other supplies. Although mail received in the province was six weeks old it always revived tender recollections of home and friends. Mail from the United States arrived by army transport from San Francisco and occasionally by coastal steamers from Hongkong.

The telegraph lines in the Philippines were constructed by men of the signal corps, who were as proficient in post digging and tree climbing as well as in other pursuits, including marksmanship. The simple natives regarded a telegraph line with suspicion and at first left it intact, but with subsequent courage frequently destroyed it, removing long stretches of wire, demolishing poles and breaking insulators until the practice became a nuisance as well as a menace. The whole line was also frequently destroyed by windstorms or typhoons. As soon as we could reëstablish communication with General Funston's headquarters, I often relayed important messages for division headquarters in Manila, which were delivered by me to the captain of the quartermaster's launch, who carried them to the nearest southern post having telegraphic communication.

On one occasion, October 18, 1900, the telegraph line was suddenly interrupted between Cabiao and San Isidro and I set out to repair it. Five other men detached as brigade scouts, all mounted, accompanied me. We located the trouble, a broken wire, halfway between the two points near a "barrio" called San Fernando. Repairs were quickly made, after which we continued to San Isidro, where we had dinner.

In passing through this barrio of San Fernando we observed nothing unusual to arouse suspicion of treachery and consequently began our return journey of six miles without hesitation or finding it necessary to increase our guard.

On reaching the outskirts of San Isidro we followed the military custom of single formation, our mounts trailing each other cautiously. We found time, however, to discuss current events and I recall an animated discussion on the national political affairs in which the "Peerless Pacifist," William Jennings Bryan, figured. The Filipinos had placed much hope for early independence in the election of Mr. Bryan, but their aspirations crumbled with his subsequent defeat.

Our discussion soon relaxed our vigilance and we rode until we reached the centre of the barrio. Before realizing it we were ambushed by a large body of insurrectos, whose broad brimmed sombreros, turned up at the front, disclosed vengeance in their countenances. Recovering from this surprise, we were startled by a volley which rang out from the deadly Mauser each man carried. The primitive custom of the Filipino in shooting with the gun resting against the hip is the only apology I have to offer for our little band escaping annihilation. However, at the second volley Corporal Walker of Company "H," Twenty-second U. S. Infantry, fell, the rest of us seeking safety in a nearby bamboo thicket. We were far outnumbered, but after a brief skirmish we eventually reached Cabiao and reported the encounter to Captain Detchmendy, post commander, who telegraphed the details to General Funston. Detachments from both posts were immediately sent in search of Walker, but unfortunately the brutal customs of the Filipinos destroyed all trace of him. Up to the time I left the Philippines, at the expiration of my term of service, Corporal Walker had not been rescued. In our efforts to rescue him many insurgents were captured and the treacherous barrio of San Fernando was laid waste, the torch applied to the nipa huts, the conflagration removing a menace to the safety of our troops.

Shortly after this adventure I was transferred to

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*Mr. McMahon is now manager of the important branch office of the Western Union Telegraph Company at 12 West Thirty-first Street, New York. A biographical sketch of Mr. McMahon appeared in TELEGRAPH AND TELEPHONE AGE dated November 1, 1910.

General Funston's headquarters as telegrapher and remained there a long time. I saw the General on many occasions and came in contact with Captain Hamilton, adjutant of the post, as well as Lieutenant Mitchell, the General's aide. General Funston was a true soldier, a strict disciplinarian and possessed a kind heart. He usually accomplished whatever he set out to do. He "cleaned up" the Province of Nueva Ecija, removing all treacherous presidentes (mayors) and hostile bands, culminating in the capture at Palanan of Aguinaldo, the Filipino rebel dictator. Many dispatches leading up to this military exploit passed through my hands. General Funston also contributed toward establishing semi-civil government in a number of localities within his command and was admired as well as loved by his associates.

After leaving the headquarters of General Funston I was detailed to San Jose, a town in mountainous Luzon, forty miles west of Bautista, the nearest railroad station. Thirty miles north of San Jose, at a place called Carranglan, cannibalism existed among the Igorrotes or Head Hunters. These savage tribes were feared by the Filipinos and even respected by our own troops.

The confidential nature of important military dispatches entrusted to the men of the United States Signal Corps make this branch of the service interesting as well as hazardous. "Leaks" in the signal corps are an unknown quantity; even ordinary "line escapes" are rare. The telegraph fraternity was well represented in the Philippine Islands during the insurrection and the adventurous characteristics of the craft were frequently exemplified during expeditionary movements throughout the archipelago.

Splicing Lead Covered Cables.

The engineering department of the Postal Telegraph-Cable Company has just issued the following instructions regarding the splicing of lead covered cables:

Slip over one of the cable ends to be spliced a lead sleeve of suitable size and length. Remove enough lead from the cable ends to permit connecting the wires conveniently. Slide over one conductor of each two that are to be spliced together a cotton sleeve about four inches long. In the case of paper insulated conductors, unwrap the paper upon the conductors to be spliced about three inches. Scrape the ends of the conductors to be connected thoroughly clean. Splice the ends together, making a pig-tail joint. Solder the joint, preferably using an iron or two ladles. In the case of paper insulated conductors, rewrap the paper over the splice and draw the cotton sleeve over the joint.

After all conductors are spliced, boil out by pouring hot paraffin over the whole to remove all moisture. When this is done, wrap all the conductors snugly together with white cotton tape about two inches wide, then boil out with paraffin again. The paraffin should be hot enough to remove all moisture but not hot enough to burn the insulation. The lead sleeve should now be slipped over the joint and the ends wiped to the cable sheath. Put the sleeve in a horizontal position, make two holes on the opposite ends on the upper side of the sleeve by cutting V's or U's in the sleeve and bending the lips back to make openings. Fill the joint with hot paraffin through one of these holes until air bubbles no longer appear at the other hole, indicating that all moisture has been expelled from the joint. The lips should then be forced back in position and sealed with solder.

Great care should be taken to remove sharp burrs or joints from the ends of pig-tail joints and to turn these joints in before wrapping and sleeving them, so that the ends will not work through and puncture the insulation and thus cause crosses.

When there is not room enough to slide a sleeve on one of the cable ends to be spliced, a split lead sleeve may be used, this being spread so as to slip it over the splice and the seam resoldered after it has been put in place. When split sleeves are being wiped on the seam should be placed on the side towards the splicer, so that when the joint is being filled the seam can be watched for possible leaks.

Personal Energy.

Energy is an inherent power—a vigorous resolution which leads men to do great things.

Men without energy are like a good many quitters, who, although bright, will not succeed in life because they lack that very essential power. A man may wake up some fine morning with a bright idea beneficial to the welfare of his company or associates. Upon arrival at his working place he speaks to the manager regarding his idea; the manager endorses it and tells him to put it into practice. The man goes to work. He makes but a feeble effort to work out his idea and soon tires of it. He lets it slip.

If this man had had energy when he started this work he would have kept on until it was completed, thereby creating a system which probably would have saved time or money to his company and meant success for himself.

An energetic man is a hustler. He is forceful, plucky, full of resolution, walks about with elasticity in his step, brightens the office by his presence, and is enthusiastic about his work. He is the kind of man all employers look for. They want a man who is always on the qui vive—a man who seldom says "When I get time I will have to do that."

Impossibilities are merely the half-hearted efforts of quitters, and they are the men that lack that essential power—kinetic energy.—*Energy.*

MR. FRANK J. SPRAGUE, former president of the American Institute of Electrical Engineers, and a member of the Naval Consulting Board, has presented a general plan to the Navy Department for coping with the submarine problem. While no details have been revealed, it is understood in a general way that the proposal is based on recognition of the principle that offensive rather than defensive measures are to be preferred in combatting submarines.

PRICE OF COPPER.—In 1914 the price of copper was about 14 cents per pound; now it is about 35 cents.

The Stock Ticker.

BY HORACE L. HOTCHKISS.

(Concluded from page 345, August 1)

At this election the general superintendent, Mr. Calahan, resigned for the purpose of inaugurating the system in London. The writer of this article also resigned his office of treasurer, and Western Union officials were elected to fill the vacancies.

The origin and subsequent history of the Commercial News Department of the Western Union Telegraph Company and the Gold and Stock Telegraph Company illustrate how a small beginning is often followed by a phenomenal growth.

Before the days of the Atlantic Cable, Mr. D. H. Craig, of Boston, conceived the idea of training pigeons to act as messengers for the European news brought by foreign steamers arriving at Halifax. He would take with him a half dozen of his pigeons, board the incoming steamer, and take passage thereon for Boston. Once on board the steamer, he would secure copies of the latest dates of the European papers and from their pages prepare a careful digest of the significant political and commercial news, written upon fine manifolded tissue papers. At the proper moment the pigeons were despatched from the steamer on their homeward journey and with fleet wings soon reached their destination, with the valuable reports, which were quickly transcribed and distributed to Mr. Craig's subscribers in Boston and by telegraph to other cities. While this system seems crude and unsatisfactory in comparison with modern methods now in use, yet at that time the fortunate subscribers to Craig's "bird mail" were often rewarded in their market operations by the possession of early information.

The alliance with the Western Union Telegraph Company proved satisfactory and the dividends on the enlarged capital were continued, and were justified by the increased earnings of the new business established in this and other cities throughout the country. The Stock Exchange, during the six years referred to, had granted to the Gold and Stock Telegraph Company, without cost, every facility for inaugurating and developing a business which then had grown to be so profitable.

Early in 1873 a formidable competitor, the Manhattan Quotation Telegraph Company, appeared in the field and offered to pay not only fixed annual rent to the Stock Exchange for the privileges enjoyed by the Gold and Stock Telegraph Company, but in addition a weekly royalty on each ticker in use. The rivalry resulted in the immediate reduction of the charge by the Gold and Stock Telegraph Company for the use of tickers from $6 per week to $10 per month. In this way a serious warfare commenced between the rival concerns which proved very interesting to the Stock Exchange by establishing the commercial value of the ownership and control of the quotations made on the floor of the Exchange.

The Manhattan Quotation Company's instrument was the invention of Mr. J. E. Smith. Its principal features were that the name of the stock and the quotation following were printed on the tape in a single line from a single typewheel, and that it was provided with a unison device. While this instrument was accurate and rapid in its work, its method of printing in a straight line did not give entire satisfaction to subscribers; nevertheless, it was thought to be a part of wisdom to absorb this company, and within a few months thereafter an arrangement for an exchange of stock was completed and a majority interest in the Manhattan Quotation Company's capital stock was turned over to the treasury of the Gold and Stock Telegraph Company and the competition was over. During this period of growth the Gold and Stock Telegraph Company secured many other valuable inventions, not only for protection in the future but also for the purpose of improving the system then operated. At this time the charge for use of tickers was restored to $25 per month. Such inventors as Van Hoevenberg, Gray, Phelps, Scott, Kenny, Chester, Pearson, Wessmann, Knudson, besides those previously mentioned in this article, contributed valuable devices and improvements in perfecting the lines, batteries, instruments and systems operated by the Gold and Stock Telegraph Company.

In developing the systems of the company, one of which was known as the "Financial News Bureau," the Gold and Stock Telegraph Company secured the coöperation of Mr. John J. Kiernan, who had been furnishing the Street with reports of the foreign markets and other news by means of "tissues" which were distributed by hand from his offices to the bankers and brokers who were subscribers to this news. After securing Mr. Kiernan's services the company inaugurated a system of wires and instruments for this purpose. He proved to be an interesting personality and was quite popular in the Street, but his friends insisted upon his entering politics. After serving as an alderman in Brooklyn, he was elected state senator and sent to Albany. But he soon found that politics would require most of his time, and gradually withdrew from the active management of the news department.

The next competitor to appear in the field as a rival to the Gold and Stock Telegraph Company was the Commercial Telegram Company, which controlled a printing instrument, the invention of Mr. Stephen D. Field. This company ignored all patents and other rights, and claimed all privileges on the ground that its instrument was superior to all others. The Stock Exchange granted to the Commercial Telegram Company equal facilities, and the competition for business resulted in again lowering the monthly charge for tickers from $25 to $10. As the competition between the Gold and Stock Telegraph Company and the Commercial Telegram Company became more active, the Stock Exchange assumed a greater authority over the quotations made on the floor of the Exchange. In assuming this control on October 1, 1885, it employed reporters, who gathered the prices and turned these quotations over to the two companies. As a result the question of how these prices were to be sent out, and to whom as subscribers they were to be sent, reverted back to the Stock Exchange, and any applications for instruments either company was required to obtain the approval of the proper officer of the board. This prevented the bucket shops from obtaining the quotations directly from the instruments. The business continued to grow, and the rivalry between the two companies increased until the year 1890, when the Exchange secured a majority interest in the Commercial Telegram Company, which was reorganized as the New York Quotation Company, and at the same time an arrangement was made with the Gold and Stock Telegraph Company by which the latter company should practically discontinue its services to members of the Stock Exchange below Canal Street, and the rate of service should be restored to $25 per month.

In 1873 the Gold and Stock Telegraph Company paid into the treasury of the New York Stock Exchange, as its portion of rent and royalty, $4,705. In 1874 the company paid to the Stock Exchange $15,731 as rent and royalty on instruments in service. Between July, 1875, and August, 1877, it paid to the Stock Exchange $50,857.16; between August, 1877, and September, 1885, for like privileges, the company paid $144,000; between September, 1885, and July, 1889, it paid $94,162.93. Between July, 1889, and January, 1892, owing to protracted negotiations with the Stock Exchange for a new contract the Gold and Stock Telegraph Company made no payments to the Stock Exchange, but from January, 1892, until January 1, 1893, the rate was $100 per day and was paid to the Exchange. From January 1, 1893, to May 1, 1902, the Gold and Stock Telegraph Company paid an annual rental of $27,000, amounting to $252,000. On May 1, 1902, the Stock Exchange increased the rental to $100,000 per annum, which sum is now paid by the Gold and Stock Telegraph Company.

The original introduction of Mr. Calahan's invention seemed most appropriately timed to meet the requirements of the Stock Exchange and other exchanges in the distribution of the quotations of the various markets by telegraphic printing instruments. Even the London Stock Exchange adopted the Calahan instrument in 1872. The Exchange Telegraph Company of London was organized, and Mr. Calahan was sent to London for the purpose of introducing the stock quotation system there. The writer of this article is a director of that company and for over twenty-five years has forwarded by cable to the Exchange Telegraph Company of London the opening prices made on the floor of the New York Stock Exchange and other news of financial interest.

The development of the Gold and Stock Telegraph Company has greatly depended upon the ability and character of its working force. One of its most valued employes was Timothy J. Sullivan, who operated by hand the transmitter during several years preceding the introduction of the present automatic mechanism. Another faithful adherent, Mr. Samuel M. Taylor, became the financial officer of the company in 1876 and now occupies the position of its auditor.

In referring to the financial growth of the Gold and Stock Telegraph Company it should be mentioned that its capital was increased in March, 1881, to $5,000,000, and soon after this was accomplished the Western Union Telegraph Company assumed a lease of the system of lines, instruments and property of the Gold and Stock Telegraph Company, guaranteeing six per cent. per annum on the capital stock. The control of the New York Quotation Company by the New York Stock Exchange, through an ownership of a majority of the capital stock of that company, has proved profitable and satisfactory to the members of the Exchange who are the patrons of the company. The wisdom displayed when the Stock Exchange, in 1890, secured a majority of the capital stock of the Commercial Telegram Company, though for some years not fully appreciated, has thus at last been demonstrated, since only through such ownership was it possible to organize the present New York Quotation Company, which corporation has placed the Stock Exchange in a position impregnable for control of the methods of collecting and distributing the quotations made on the floor of the Exchange. To the committee in charge of this matter much credit is due, but, above all, it is to the devoted services of Mr. R. H. Thomas, who is the president of the New York Quotation Company, that the Stock Exchange owes a debt of gratitude for the successful solution which brought results so fruitful out of a difficult problem. When one considers the vast network of telegraph wires reaching out to every city, town, village and hamlet throughout the continent, it would seem almost impossible to estimate how far the capacity for the distribution of the quotations can be extended. The Western Union Telegraph Company, with its trunk lines pulsating each day between 10 a. m. and 3 p. m. with a constant stream of market quotations, and by means of "relay and sounder" in every office where these trunk lines pass, and of the branch lines running in every direction to all places and to all people, even to those outside of their twenty-three thousand offices, can drop off duplicate copies of these prices or quotations from all important exchanges.

The growth of this business is of great moment to the Stock Exchange, for it is through the instant dissemination of the quotations made on its floor that the active and continuous interest in the markets is sustained.

Mr. I. D. Hough, a well known member of the telegraphic profession, who has just been appointed superintendent of telegraph of the El Paso and Southwestern System, with headquarters at El Paso, Tex., in remitting to cover his subscription for another year, writes: "The AGE has almost always been in our family. I have a scrapbook which contains clippings from the AGE published more than twenty years ago. I am sure that our first class telegraph electricians today owe more to this paper than to any other source for the knowledge they have of the technical telegraph. I know that I do."

AWAKENING OF RUSSIA.—The legal time in Russia has been advanced one hour, to continue in effect until September 13.

Origin of the Western Union Telegraph Company.

(*Continued from page 355, August 1.*)

Art. 15. The said Sanford J. Smith and Isaac Butts are to construct said line from the City of Buffalo to the City of St. Louis, according to the contract hereinbefore mentioned, in the manner following, viz.:

There shall be at least thirty posts to the mile, which shall be not less than thirty feet long; they shall also be twenty-seven inches or more in circumference, four and a half feet from the butt, and twelve inches in circumference at the top, and they shall be set into the ground five feet. The posts shall be of the best timber—reference being had to durability—which is readily accessible on the route through which the line is to pass.

Upon these posts shall be stretched two conductors of single iron wire of the best quality, one of which shall weigh not less than six hundred pounds, and the other not less than four hundred and fifty pounds to the mile.

The insulation used for the upper wire shall be that recently invented by the said Royal E. House, consisting of a heavy glass insulator, cast or moulded, with a screw to secure it at the top of the pole, and inclosed in a cast iron cap, to which it is also secured with a screw; the side insulator shall be such as shall be approved by the said House.

One of House's Printing Telegraph instruments is to be furnished by said Smith and Butts for each of the following places, to wit: Erie, Cleveland, Columbus, Dayton, Indianapolis, Terre Haute, Louisville; and two each at Buffalo, Cincinnati and St. Louis—provided the line shall intersect each of these places. But in no case shall the number of telegraph instruments be less than that herein specified; provided that so many be required at those and other places, upon the completion of the line.

Suitable offices shall be procured at the several stations on the line in which the machine shall be set up in a proper manner for use; but the rent and all expenses of fitting up said offices, except furnishing and setting up the instruments, and connecting them properly with the line, shall be borne by the Company.

The whole line is to be put in complete working order by the said Smith and Butts, according to the aforesaid contract.

Art. 15. The Board of Directors shall not be authorized to issue the portion of the stock which is appropriated to be paid or given for the rights specified in Article Seventh, until such rights are fully transferred, conveyed or assigned to this Company, in such manner as to vest the same in this Company, according to the true intent and meaning of said article.

Art. 16. Whenever the first payment on stock is made, the Treasurer shall give a script certificate of stock, stating the amount of each share, the number of shares which the holder thereof is entitled to, the amount paid thereon, and that the same is only transferable on the books of the Company, and on the surrender of such certificate.

Art. 17. Every part and portion of the aforesaid telegraph line, as fast as the same shall be constructed, together with all posts, wires, insulators or other materials procured for said line, shall become and be the full and complete property of this Company, and every member of this Company shall be bound to execute to the corporation such conveyance and assignment as shall be necessary to vest the said corporation with all the rights of property aforesaid, and all the rights of constructing and using on the said line the aforesaid Printing Telegraph and insulators, and all improvements thereof, and all renewals of the same, as specified in the aforesaid Seventh Article.

Art. 18. The first annual meeting of the stockholders shall be held at the Mansion House, in the City of Buffalo, on the first Tuesday of April, in the year 1852, or at some earlier day, to be appointed by the Executive Committee, in case the line shall be in working order through its entire length, prior to January 1, 1852, of which earlier meeting the same notice is to be given as for a special meeting of the stockholders. The subsequent annual meetings shall be held on the same day in each year.

Art. 19. Special meetings of the stockholders shall be called by the President at any time, on the written request of the persons holding, or entitled to, one-third of the capital stock of this Company. Such request shall specifically state the object or objects of the desired meeting. The President shall appoint such meeting and the Secretary shall give written notice thereof, stating the object of the proposed meeting, which notices shall be sent by mail, at least thirty days prior to the time of such meeting, addressed to the several stockholders, at their respective places of residence, as they appear on the books of the Company; but no such meeting shall be held to be irregular or invalid, for want of due notice to all the stockholders, unless the omission to give such notice was willful and fraudulent.

Art. 20. The Board of Directors, with the consent of two-thirds of all the members thereof, whose names are to be entered in the minutes of their proceedings, may merge or unite this line with any other telegraph line or lines which may be authorized to use House's Printing Telegraph, on such terms as shall appear just and equitable; and the stockholders in this Company shall be entitled to at least the same amount of stock in the said incorporated Company, to which this Company shall be united, as they were respectively entitled to in this Company.

The said Directors with the like consent may also purchase for the Company any line or part of a line of telegraph already constructed, to form a part of this line, if, in their judgment, such purchase will be for the benefit of this Company. And in case of any such purchase or purchases, so much of the cost thereof as would be equal to the cost of the same extent of new structure, shall be borne by the said Sanford J. Smith and Isaac Butts, and the balance, if any, shall be chargeable to the association.

The said Directors may also lease for the Company any line or part of a line of telegraph, if in their judgment such leasing will be for the benefit of this Company.

Art. 21. Whenever the President shall receive notice from the said Sanford J. Smith and Isaac Butts that the line from the City of Buffalo to the City of St. Louis is completed and ready for operation, he shall call a meeting of the Directors, for the purpose of taking such measures in relation to the inspection of the said line and the acceptance thereof by this Company, as they may deem advisable, in the proceedings of which meeting neither the said Sanford J. Smith nor Isaac Butts shall have any voice. Or, the Directors, at their option, may at any time accept any portion or section of such line as may be in working order. And from the date of such acceptance, such portion or section of line shall be operated by and for the benefit of the corporation; and all liability of said Smith and Butts, as regards any particular section or portion of line, shall be terminated by the acceptance thereof, as herein provided for. But, with the restrictions here specified, the said Sanford J. Smith and Isaac Butts shall be liable for all defects and deficiencies of said line, until it is duly accepted by the Directors.

Art. 22. The subscriptions to this stock shall be payable in four installments of twenty-five per cent. each. The first installment shall be payable on demand, or within thirty days thereafter. The others shall be payable at the call of the Executive Committee; and the Treasurer shall give a written notice of such call, which shall be deposited in the Post-Office, at least thirty days prior to the time of payment, and addressed to the several stockholders, at their respective places of residence, as they appear on the books of the Company.

In case any subscriber shall fail to pay the amount thus called for at the time specified in such notice, he shall forfeit his stock and all previous payments thereon, or remain liable on his subscription, at the option of the Board of Directors; all payments to be made to the Treasurer of the Company, or to his order, for the benefit of this Company.

Art. 23. Whenever the persons holding one-fourth of the stock shall present a written request to the President for an increase or decrease of the number of Directors, at least two months before the annual meeting of the stockholders, he shall direct the Secretary to give thirty days' notice through the post-office, to each stockholder, that the question of an increase or decrease of the number of Directors will be presented at such annual meeting, at which time the number of Directors may be increased or decreased by a majority of the votes given thereon, but the number shall not at any time be less than that fixed by these articles.

Art. 24. Whenever the Board of Directors, by the vote of a majority of all the members thereof, shall determine that it is for the interest of the Company to extend its business by adding to the number of wires or conductors upon the line aforesaid, or by constructing any other line or lines to operate in connection therewith (in case the patent rights can be obtained from the proprietors thereof), they shall enter their determination upon their minutes at large; and all such additions shall be made by an increase of the capital stock, and in no other manner. The Board shall fix the amount of increase necessary for the purpose aforesaid. They shall cause thirty days' notice to be sent by mail, addressed to each of the stockholders at his place of residence, of a meeting of the stockholders, at which the question of increasing the stock, specifying the object thereof, is to be submitted. If at such meeting the persons owning two-thirds of the stock shall vote in favor of such increase, or if, within two months thereafter, the persons owning two-thirds of said stock shall give a written assent thereto, the Directors shall be authorized to increase the stock accordingly. No meeting shall be held irregular or invalid for want of due notice to all the stockholders, unless the omission to give such notice was willful and fraudulent.

Art. 25. These articles shall be, and form, a part of the by-laws and regulations of this corporation, until the same shall be altered as herein provided. And the said Directors shall provide for the distribution of the capital stock of the said corporate body among the persons entitled thereto in proportion to their respective rights and shares therein.

Art. 26. Every person subscribing to these articles shall designate his place of residence, and every person becoming the assignee of any stock or share shall in like manner designate the place of his residence, to which places all notices required by these articles may be sent.

Art. 27. At all meetings of the stockholders, each stockholder shall be entitled to one vote on each share of stock appearing by the books of this Company to have belonged to him for at least thirty days prior to such meeting; but no one stockholder shall give more than one-fourth part of the aggregate vote of the Company. Any stockholder may vote either in person or by proxy.

Art. 28. Every person who shall take stock in this Company by subscription, transfer, or otherwise, shall be deemed to assent to the foregoing articles; but the same may be altered at any annual meeting of the stockholders, by the vote of the persons holding a majority of the stock, except the article in relation to the increase of stock, which shall not be altered without the vote of the persons holding two-thirds of the said capital stock; and excepting also all those articles which embrace some matter of contract between the Company and the patentees or contractors for building the line, which last articles shall be and remain unalterable, without the consent of each and every party thereto.

Art. 29. The Board of Directors shall cause certificates of the stock of this Company to be issued to the several parties entitled thereto, in proportion to their respective rights, and for the purpose of enabling them to do so, duplicate copies of all contracts, by virtue of which any person shall be entitled to any of the said stock, shall be filed with this Company. But the portion of stock representing the patentee interest shall be issued to Samuel L. Selden and Freeman M. Edson in trust, to be by them distributed to the respective parties entitled thereto.

(To be continued)

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

JOINT RESISTANCE OF CIRCUITS.—(*Continued*)

When the resistances of wires placed in multiple are not alike, the rule for finding their joint resistance is a little more complicated than that for finding the joint resistance when the resistances of the individual wires are identical. The rule is as follows: The joint resistance of circuits in multiple is equal to the reciprocal of the sum of the reciprocals of the respective resistances of the circuits.

This rule sounds more formidable than it really is, and to make it more intelligible to those who may be inclined to "drop it," because it does sound uninviting, we give the following explanation: The reciprocal of any number is the quotient obtained by dividing one by that number, and the sum of a given number of reciprocals is obtained by adding together the various quotients. Consequently, the reciprocal of the sum of any number of reciprocals is found by dividing one by that sum.

For example, the reciprocal of 20 is .05, because $\frac{1}{20} = .05$. On the other hand, the reciprocal of .05 is 20, because $\frac{1}{.05} = 20$. Thus the reciprocal of a number may be called the converse of that number.

Again, the sum of reciprocals may be shown thus: $\frac{1}{20} + \frac{1}{20} + \frac{1}{20} = .15$, which is the same as $.05 + .05 + .05 = .15$. Hence the reciprocal of the sum of the reciprocals of $20 + 20 + 20$ must be $\frac{1}{\frac{1}{20} + \frac{1}{20} + \frac{1}{20}}$, that is, $\frac{1}{.05 + .05 + .05} = \frac{1}{.15} = 6.66$.

Electrical conductance, or conductivity, is the reciprocal, or converse of resistance, and contrariwise, resistance is the reciprocal, or converse, of conductance.

That which tends to increase resistance decreases conductance, and whatever increases conductance decreases resistance.

The unit of conductance is the "mho," which spelling is the reverse of ohm.

The conductance of a conductor, obviously, increases directly as its conducting power increases. Thus, if we connect two wires in multiple, each having a conductance of, say, six mhos, the joint conductance of the wires would be the sum of their respective conductances; that is, twelve mhos. Or if three wires of six, twelve and eighteen mhos were thus connected the joint conductance would be thirty-six mhos. That is, the conductance of the three wires combined would be equal to the conductance of six wires of six mhos each, or to one wire of thirty-six mhos conductance. For example: Assuming the case of any three wires, each having a resistance of six ohms, it is clear from what has been stated that each would have a conductance of $\frac{1}{6}$ mho.

(*To be continued*)

QUESTIONS IN TELEGRAPHY.

When the resistances of wires connected in multiple are not alike, how is the combined resistance found?

What are the relations of electrical resistance and electrical conductance?

What are the units of electrical conductance and of electrical resistance?

Telephony.

THE FUNCTIONS OF CONDENSERS IN TELEPHONE CIRCUITS.

As explained in a previous installment of this article, the condenser will allow an alternating current to pass through it, but blocks the passage of direct current. Now, all alternating currents do not fluctuate at the same rate of speed; some change their direction only eight or ten times a second, while others may change at the rate of 10,000 times a second. This rate of fluctuation is called "frequency." The lower the frequency of an alternating current, i. e., the lower its rate of fluctuation, the more nearly it approaches the character of a direct current; consequently the condenser will offer a much easier path to high frequency currents than to those of low frequency.

This property of the condenser makes it very useful on "farmers' lines," where thirty or more subscribers may be connected to one line. On this type of circuit the alternating current used for ringing divides, part going to each subscriber's station, so that when one subscriber calls another he operates all the ringers on the line. With as many subscribers as this on one line it frequently happens that on the completion of a call one of them forgets to hang up his receiver, thus causing his set to be a very much easier path from one line wire to the other than is afforded by all the ringers in the other sets. Under these circumstances the ringers would not get sufficient current to operate them and it would be impossible for one subscriber to call any other until the trouble had been located and the receiver replaced on the hook. This difficulty is overcome by placing condensers in the different sets in series with the receivers. These condensers, by limiting the magnitude of the low frequency ringing current through any receiver which may be off the hook, permit enough current to flow through the ringers to operate them. As the talking current is of considerably higher frequency than the ringing current, the condensers do not cause it to be decreased sufficiently to affect transmission to any appreciable extent.

Radio Telegraphy.

DEFINITION OF ALTERNATING CURRENT TERMS.

(Continued)

If the voltage or current varies as a sine curve, the voltmeter or ammeter will not read the peak or amplitude value, because this value lasts for only a short part of the total time, but a fractional part, $0.707 = \frac{1}{\sqrt{2}}$ of the peak value. Similarly, if the voltmeter or ammeter reading is given the peak value or amplitude can be found by multiplying by $1.41 = \frac{1}{\sqrt{2}}$

The frequency of the alternating current is sometimes indicated by a frequency meter, which in one type consists of a series of flat steel springs or reeds, each with a different period of mechanical vibration, which is marked on it, the whole series covering a range of frequency from, say, 470 to 530 vibrations per second. Behind the springs is an electromagnet carrying the alternating current the frequency of which is to be measured. When the frequency of the electromagnetic impulses is the same as that of any one of the reeds it is set into vibration by resonance with these impulses, and the frequency of the current is then the same as that marked on the reed in vibration.

HIGH FREQUENCY CIRCUITS.

The circuit of coil *L*, condenser *C*, and spark gap *S*, as shown in heavy lines in Fig. 3, June 1 issue, is called the closed oscillating or primary circuit, as distinguished from the open, radiating or secondary circuit which will be described in a later issue. These three elements are always connected in series to form the circuit, which is found in all spark excitation types of radio stations.

There are two different methods of connecting the transformer secondary leads to this circuit for the charging of the condenser, one of which is shown in the upper part of Fig. 3, June 1 issue, where the condenser is seen to be directly across the transformer secondary leads, and the other in the lower part where the spark gap is so connected. In this latter case the condenser is charged through the inductance *L*, but its resistance and inductance are so small as compared with that of the transformer secondary as to have no effect in the charging.

There is no essential difference in the operation of the two types of connections.

(To be continued)

Shop Talk.

BY THE OBSERVER.

Not long since the Western Union Telegraph Company issued instructions that every morning of the year the selectors or concentration units should be tested to ascertain if they were operative from the distant office making the code. This is an excellent order, for anyone familiar with the selector knows that unless it is in good condition, and the relay that controls it is properly adjusted, there will be many failures to operate, delays to business, etc. Testing a selector with an intermediate office during rainy weather will only prove one thing and that is, whether or not, everything is O. K. as far as the selector and its lamps are concerned. It is only when the main line relay operates the selector, while the distant office makes the code, that you can be assured you have obeyed the instructions, and certainly the task is not a hard one. Just suppose there is but one wire on the route. You have no business for the terminal; it is Sunday; all intermediate offices are closed; you have not made any effort to test the selector on the particular circuit; a lamp is burned out; the relay is out of adjustment; the selector skips or hangs. What will become of the particular message that the terminal has? Now this same thought should actuate you every day of the year, and that means keep your selectors up to their maximum efficiency, and you can only do that by proper care.

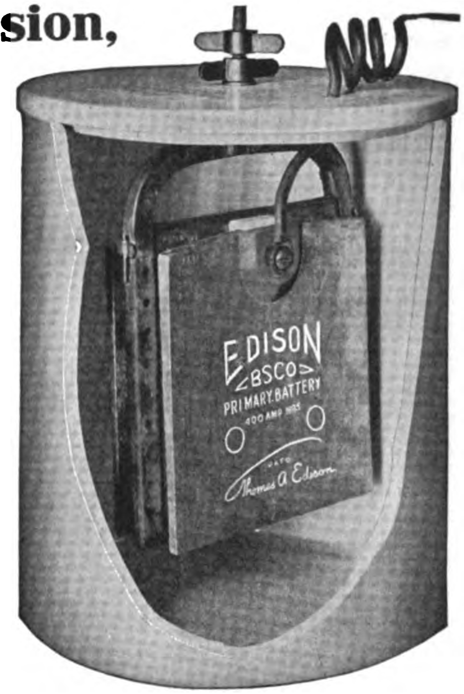
The Gill selector people have published a pamphlet showing how to clean, oil and adjust the selectors. The Western Union has in specifications stated just when the coils shall be in multiple and when in series. A strict compliance with these instructions is necessary for the proper life and maintenance. Probably some of the greatest reasons for selectors failing to act are: Leaving the relay wedge cut into jack at the concentration unit, or leaving keys open on repeater tables—both acts of carelessness. Too many attendants, when they find a selector hangs or skips occasionally, pass it over. A selector that hangs or skips should be taken out and treated as shown in the instructions. It is only by such prompt action that the standard of efficiency can be maintained.

There are many complaints made that selectors do not work, and when the attendant tries it out he finds nothing wrong and passes it along without further thought, only to receive a similar complaint shortly after. Whenever this occurs, find out the office making the complaint and then ask him to make the combination. You will usually find that he either leaves his key open between the code "numbers" or he rushes so fast the wheel has not time to roll to the bottom, and unless the wheel rolls to the bottom it is impossible for the outside offices to properly operate the selector. Now, any selector will require at least ten seconds for its proper operation, and surely it is much easier to spend ten seconds in calmness than many minutes in a passion of anger because you cannot raise an office. Try it and you will see. The selector is here to stay, and does not require a great amount of care—only a little at times—and a small amount of time. Surely all will cooperate to make it a grand success.

(To be continued)

Clear Transmission, Always Necessary, Warrants Use of the Highest Grade Battery

A low internal resistance battery that will not polarize, and maintains constant voltage, is sure to give better results in telephone work than a set of cells whose voltage constantly drops when on discharge, or in which the voltage is high or variable.



Type 403 400 Ampere Hours Capacity

The Edison Primary Cells

maintain a lower uniform internal resistance than any other primary type; they furnish constant voltage and do not polarize at normal discharge rates; the 400 ampere hour size has a life greater than twenty single sets of dry cells and they require no attention between recharges, even though the service is such that a period of years is required to consume their capacity.

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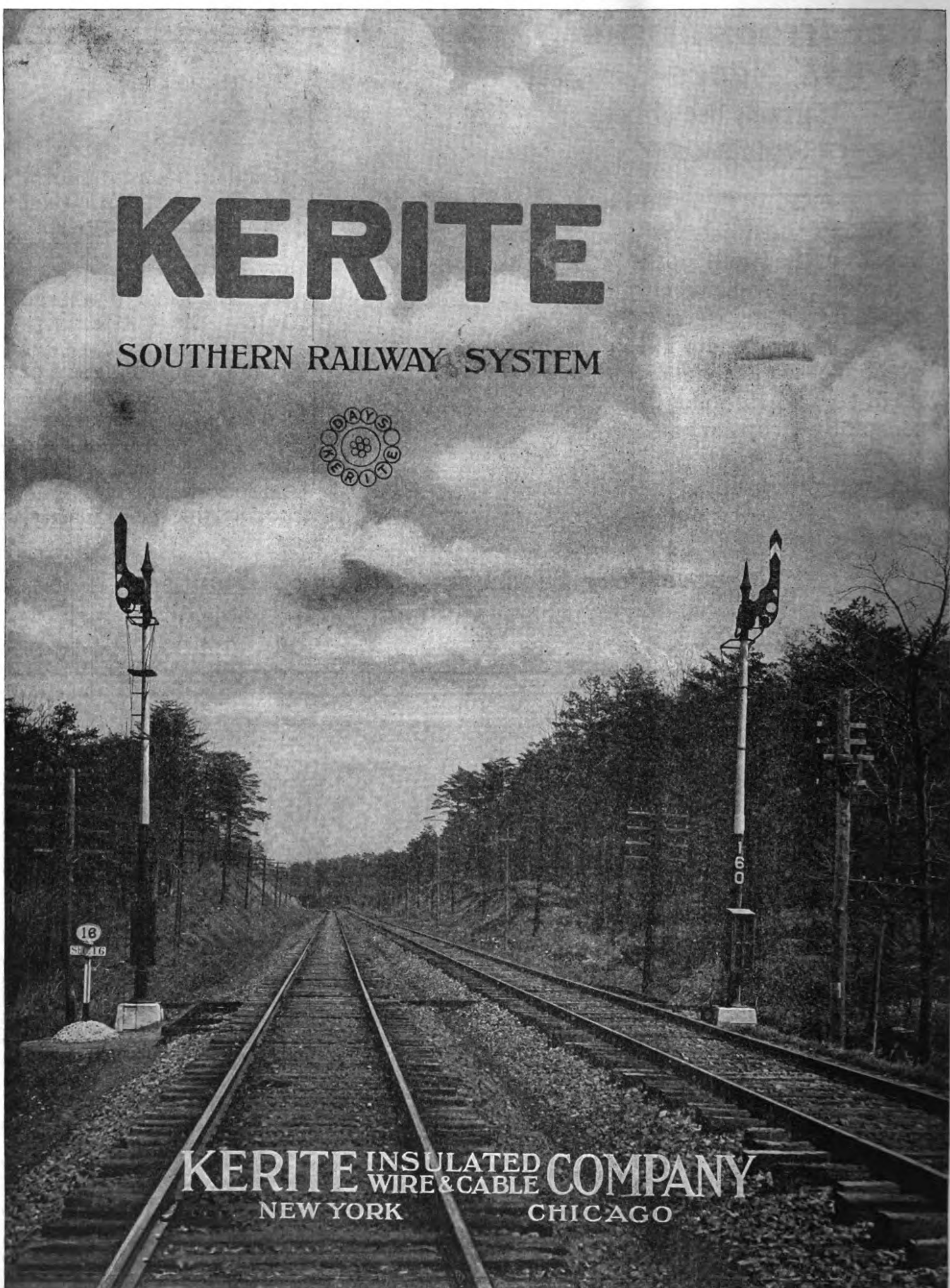

KERITE

SOUTHERN RAILWAY SYSTEM

DAYS KERITE

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO

THE RAILROAD.

Postponement of Convention.

As was announced in the August 1 issue of this paper, the annual convention of the Association of Railway Telegraph Superintendents, which was to have been held in Washington, D. C., September 18, has been cancelled on account of the war situation. In its stead a special meeting of the association will be held in Chicago for a session of a day or two some time during November. This meeting will be strictly a business session, and in order to secure unbroken attention to the proceedings there will be no entertainment features to divert the minds of the attendants.

The cancellation of the regular convention, however, will not affect the interim work, and the committees will continue their labors and be prepared to report to the special meeting in November, just as they would to the full convention were it to be held at the originally appointed time.

Mr. W. L. Connelly, Gibson, Ind., is secretary of the association, and he will be glad to hear from any member who wishes further information on the affairs of the association.

Association of Railway Telegraph Superintendents.

Mr. E. C. Keenan, chairman of Committee No. 6, of the Association of Railway Telegraph Superintendents, has sent the following letter to members of the Association:

Special Committee No. 6, Telegraph and Telephone Development, is charged with the duty of keeping the Association informed in regard to development of the telegraph and telephone in general, and especially for such matters as may advance the efficiency of such facilities in railroad service.

Committee No. 6 will report on what has transpired since the last meeting at the special meeting of the Association to be held in Chicago during November, and your attention is called to the general subject at this time with the request that you advise the committee of any matters of interest concerning the development of the telegraph and telephone which you think should be investigated and reported upon at our special meeting for the benefit of the Association.

Telephoning from a Moving Train.

Successful experiments with a telephone apparatus installed on a railroad car were carried out recently on the Canadian Government Railways, writes the United States Consul at Moncton, N. B., Canada.

Reports of the tests declare that the communication established was in every way satisfactory, although the train was in motion. It is said there was no difficulty in hearing distinctly every word of the messages exchanged.

The experiment was tried on a double-track line where the rails are properly "bonded" for the block signal system, but it is claimed that equally good results can be obtained on any track where the rails are similarly "bonded," without regard to the presence or absence of a block signal installation.

MUNICIPAL ELECTRICIANS.

Convention of Municipal Electricians.

The twenty-second annual convention of the International Association of Municipal Electricians will be held at Niagara Falls, N. Y., September 11 to 14, both inclusive. The headquarters will be at the International Hotel, and the hotel rates will be reasonable.

Mr. Marti Donohue, city electrician of Niagara Falls, is making elaborate preparations for handling and entertaining the convention, and nothing will be left undone for the comfort and welfare of the members during their stay in that delightful spot.

Space for exhibits will be free, and those desiring to make displays are requested to communicate with Mr. M. J. Donohue, city electrician, Niagara Falls.

In a letter to the members, Mr. Clarence R. George, secretary of the association, says:

"In these epoch-making days of our country it is up to every member of this association to attend; he should do so from patriotic motives if from nothing else. It is our duty, as representatives of so vital a branch of municipal governments, to be in the highest state of preparedness possible. This cannot be attained in any better way than by coming to the convention, listening to the many excellent and timely papers that have been prepared by some of the most eminent among the electrical men of the country and participate in the discussions that will accompany them.

"Many organizations have decided not to hold their conventions this year, therefore it is for us to show the people generally that the municipal electricians do not let wartime conditions prevent them from meeting in annual convention. Our work is becoming recognized as more important each year; every member should observe this, attend the convention and bring along at least one new member."

Policemen's Rights Infringed by Signal System.

A telephone police signal system has just been installed in Maysville, Ky. It includes a private branch exchange at police headquarters, with stations in various parts of town. Direct wires run to each of the ironclad stations, and a six-inch gong summons the officer at any station when headquarters wants him.

This service takes the place of a party line wire which had eleven stations, and when it was installed the chief of police issued an order that every man must call central station from a given box at each hour. All but two of the seven policemen turned in their resignations. The sixth stuck it out for a few days and he, too, quit.

Convention Proceedings.—The proceedings of the twenty-first annual convention of the International Association of Municipal Electricians, which was held at Baltimore, Md., August 22-25, 1916, have been issued in the form of a substantially bound volume. Mr. Clarence R. George, of Houston, Tex., is secretary of the association.

"Do your Bit" by subscribing for Telegraph and Telephone Age. Only $2 by the year.

Efficiency Engineering in the Telegraph Service.

(Continued from page 350, August 1.)

In the previous chapter the neat appearance of local officials of the company was alluded to as a necessary qualification to good management. It is well known that many local managers and chief operators in the olden days thought it a matter of distinction to wear office coats covered with dust, dandruff and other disease breeding germs. The wearing and removal of the coat each day alone prevented spiders from weaving cobwebs around such garments. A man in these days entertaining ideas of this character would appear disgusting to the up-to-date official who is, as a general thing, alert and neat in appearance.

Another subject that we have been asked to touch upon is the habit of some employes being permitted to have tailors, grocerymen and tradesmen in general dun them at the office for money long overdue. Many otherwise enterprising telegraphers—and when we say telegraphers we mean managers, chief operators and superintendents — have permitted themselves to be classed with the non-paying portion of the community in which they reside. We have one record where the manager of a telegraph department in a large banking institution was paid a salary of $100 per week. Apparently the man had no bad habits, yet the grocer, the butcher, the milkman and other tradesmen endeavored to collect bills at his office. This attracted the attention of his employers and they were not slow to inform him that they paid him an exceptionally good salary for the work he performed, and if he could not live within his income they would find someone else to take his place. He had acquired the habit of living beyond his means and it was difficult to shake it off. The tradesmen continued to call and the man's position was soon lost to him forever. He is now working at a telegraph key at $20 per week. Was the banking institution right? Has any man, whether he receives $100 per week or $15 per week, the right to run into debt and then have his employers' time consumed in explaining to the collectors of bills that he is unable to pay? The case cited is only one in hundreds, and we might say thousands. This one is mentioned, however, because of the large salary involved. It is an actual case, however.

All bills should be paid promptly. If they are not they become annoying and a nuisance and will damage a man's reputation. If there is any reason why they cannot be paid, the one to whom the money is due should be so informed. The result will be that an extension of time will be granted once, twice or three times if need be to make payment convenient. It must not be overlooked that the tradesmen are just as much entitled to their money as the telegraph man is entitled to his salary when it is due. If the latter is not paid promptly he kicks up a big row. He does his work in a very sloppy manner and neglect of duty is apparent on all sides. That, he thinks, is a different side of the question. He forgets that all questions have two sides and the question in this case under discussion means money.

The telegraph, the telephone and the railroad companies all insist that their employes shall pay their debts. Their positions are in jeopardy if their bills are not paid. No matter what a man's income is, he must live within it. Institutions without number have been started to teach frugality and thrift and those who took advantage of the operation of such financial institutions in their early days have much to be thankful for, while the man who thought he was the best judge as to the method to follow in saving his money never gets anywhere and is always in debt. It is the old story—he lacked method and efficiency. It is hard to make him realize that $1 a week saved amounts to $52 per year.

Our banking institutions, twenty-odd thousand of them in the United States, are selling Liberty Bonds on the instalment plan, payable $1 per week. They report without a single exception that this Liberty Loan has accomplished more to encourage thrift among the people of the United States than anything that has been previously brought to the attention of the public. Patriotism was behind this loan. Self-respect should be behind the man who is in debt.

"Lend me a dollar until pay-day," is a phrase that has spelled ruin for many a young man and trouble for his friends, says an authority. The habit of living ahead of your income and behind your bills is one that strikes at the very foundation of character. Before a man can become a chronic borrower he must part company with self-respect and self-reliance. When he has become a dependent, leaning on others of more frugal habits, he can no longer look the world squarely in the face. The question of borrowing a dollar is of small importance on the face of it, but the question of selling one's self-respect and stability by squandering more than one earns is a matter of fundamental consequence.

Then there is the case of the lender to be considered. It will only be a question of a short time until the borrower fails to meet his obligation, for the habitual borrower is the worst payer in the world. No man forgets his friends so quickly as he, and when he is pressed the least bit about paying his honest debts he is quick to forfeit a friendship and to berate his friend.

The greatest kindness one can do to the chronic borrower is to give a firm refusal to his request. The thing he needs above all things else is to be turned down. A few such experiences may serve to set him thinking and awaken him to the fact that no man who has his health has any business living on the bounty of his friends.

(To be continued)

Insulators.

Glass insulators for telegraph and telephone lines are used almost entirely in this country, largely on account of their cheapness and convenience. Porcelain has been thoroughly tried in late years but does not seem to have given as good satisfaction as does glass. The surface of glass has a strong affinity for moisture and becomes covered with a moist film in nearly every state of the weather. This film is detrimental to insulation but nothing has yet been discovered that gives a perfectly dry surface under all weather conditions.

OBITUARY

Death of James N. Worl.

James Norris Worl, a forty-niner of the telegraph, aged eighty-three years, died in the Muhlenberg Hospital, Plainfield, N. J., on July 31. Mr. Worl had been in poor health for several years. He was a unique character in the telegraph business. He was born in Philadelphia, April 15, 1833, and entered the service at the same place in 1848. There were only four operators in the Quaker City and less than 100 telegrams handled per day at that period. For thirty years Mr. Worl occupied prominent positions in the front ranks of telegraphy.

During the Civil War he was superintendent of the Independent Telegraph Company at Baltimore. On the day that the entire staff of this company was arrested, charged with having transmitted over its wires the alleged proclamation of President Lincoln calling into service an additional 300,000 troops (Joseph Howard being the forger of the proclamation, which was intended to influence the gold market), Mr. Worl happened to be in the Washington, D. C., office, where he was arrested with the rest of the force. He was incarcerated in the famous prison in Washington where were confined many celebrated Confederate participants in the war, as well as Belle Boyd, the noted spy. After three days' confinement Mr. Worl was released and the Government made ample apologies to him for the mistake it had made in seizing the property of the company and arresting the employes.

In 1866 Congress granted to Mr. Worl and his brother, W. S. Worl, exclusive cable landing rights on the Atlantic Coast for twenty-five years. When this Act of Congress was signed by President Johnson he turned to Mr. Worl and stated that it gave him great pleasure to sign this congressional action. Under its operation the French Cable Company and the Direct United States Cable Company had to pay Mr. Worl for the landing rights for their respective cables $200,000 each.

A French syndicate was formed in the early seventies to purchase the franchise from Mr. Worl for $1,000,000. In the meantime a stock company had been formed in the United States to control the landing rights. Mr. Worl and his brother invested all of their money in purchasing back the outstanding stock in the American company in order to turn the franchise and the company in its entirety over to the French syndicate. The $1,000,000 was in a French bank awaiting the transfer. When the day arrived for the execution of the papers the world was startled by the announcement of the failure of the Paris bank—the Credit Foncier—and the certified check with which to purchase the United States cable landing rights was worthless. Mr. Worl and his brother were left heavily in debt. For many years after this Mr. Worl engaged in outside business, in politics, and for twelve years acted as postmaster at Ravenswood, Long Island.

His telegraph activities included the construction of private lines connecting offices with factories and suburban towns with cities. In 1872 he became interested in horse railroads, organizing and promoting the company and constructing the road from Hunter's Point to Astoria and Steinway, L. I.

He is survived by his wife. His last words were "Jesus is calling."

George A. House, an old-time telegrapher of Cohoes, N. Y., died at that place on July 25.

Edward M. McCullough, aged fifty-four years, an operator in a broker office at Dubuque, Iowa, was drowned while bathing on July 29.

Robie Blake, aged seventy-eight years, for thirty-six years in the service of the Western Union Telegraph Company, died in Cornish, Me., July 25.

Arthur K. Ingraham, aged seventy-five years, an oldtime telegrapher, died at Bridgeport, Conn., on July 14. He was one of the charter members of the Telegraphers' Mutual Benefit Association and held Certificate No. 25.

William G. Bee, a vice-president of the Edison Storage Battery Company, Orange, N. J., died at his home in that place July 18. The funeral was attended by more than 400 Elks and other friends, including Mr. and Mrs. T. A. Edison.

James B. Finnan, an old-time Baltimore, Md., operator, for seventeen years identified in an official capacity with the Order of Railroad Telegraphers at its headquarters in St. Louis, died in Baltimore on July 31. He had gone to Baltimore on a visit two weeks previous to his death, where he was taken ill and died at the home of his sister.

INDUSTRIAL.

Kleinschmidt Perforator.

The Kleinschmidt Electric Company, New York, has issued a pamphlet describing the Kleinschmidt keyboard perforator. The illustrations used are very artistically finished, the type is large and clear and the paper of excellent quality.

Diaphragm Sounder.

. The diaphragm sounder, manufactured by the Railways Labor Saving Device Company, Davenport, Iowa, is rapidly growing in favor among telegraphers throughout the country, outside of the railway and government service. Many operators are buying the instruments on their own account. They discard the use of the ordinary sounder entirely, preferring to read the messages from the diaphragm sounder because the sound of that instrument seems to be more pleasing to the ear.

The Phillips Manufacturing and Trading Company, universal providers, 396 Broadway, New York, announces that it sells everything at retail, and exact cash is required with orders. If anything purchased from the company is unsatisfactory, the goods will be returned within ten days without expense to the purchaser. All purchasers are elected members of the "Society of the Precious Few," and a certificate of membership is issued to each person joining. This company was founded by Mr. Walter P. Phillips, the well known old-time telegraph and newspaper man.

Cooperation of Electrical Engineers Necessary in the War.

In an address before the special meeting of the American Institute of Electrical Engineers in New York, June 27, Mr. E. W. Rice, Jr., president-elect, spoke of the obligation on electrical engineers of working co-operatively to bring the war to a successful conclusion.

"War is a business," he said, "and must be handled as a highly organized, centralized enterprise. We must, no matter how repugnant it may be to our habits and thoughts, temporarily adopt such methods of our enemy as are known to be efficient and successful, because the penalty of failure is death.

"The things connected with war are so repugnant to our idea that it takes time to realize the necessity for and make the colossal changes demanded. We must, therefore, as I have stated, avoid captious criticism and confine ourselves to constructive criticism, and that sparingly and sympathetically administered.

"There is one idea which we must abandon. The great majority of our people, having no acquaintance with science or engineering, are prone to imagine that this war will be settled quickly by some wonderful new invention, as if by an act of legerdemain; but you engineers realize that such a thing is practically impossible. It is so hopeless that it is cruel to permit any such idea to take hold of the American public. Neither is it possible for the war to be settled by the act of some hero or superman. It can only be settled by the united efforts of thousands of men, each contributing his bit. Team play in our civil army at home is as essential as in our fighting army abroad.

"I venture to suggest that we cannot all occupy desks at Washington, and it is well for us, and for the country, that we cannot. We can, however, put ourselves and our business in such condition as to meet whatever demand is made upon us. Only relatively few can be useful in the direct service of the army and navy, but there is plenty of honorable work and useful work for us to do. The most effective work for most of us will be in the shops and offices at home, and everyone who does his work loyally and well is as much a factor in our organized war as the man at the front."

Indian Wireless System of Communication.

As far back as 1898 a discovery was made of a system of communication used by an indian tribe in the Amazon Valley in South America. The apparatus used by the indians is called Cambarysu and consists of a hole in the ground about half filled with coarse sand; above this layers of fine sand, fragments of wood and bone and powdered mica fill it almost to the surface of the ground. These materials are surrounded by a case of hard palm wood, which extends above the surface. The upper part of the apparatus consists of layers of hide, wood and hard rubber.

Between the upper layers and the lower layers there is a hollow space. With a club, much like the stick used to play the bass drum, the native strikes the layer of rubber that forms the top of the instrument.

One of these instruments is concealed in each hamlet of the tribe. The villages are not more than a mile apart and are placed in a direct north and south line. Although a person standing outside the building in which the apparatus is kept cannot hear a blow of the stick on the rubber top, it is quite distinct in a similar building a mile distant. When one of these instruments is struck the neighboring ones to the north and south echo the blow. The indian stationed at each one of the posts answers the signal and by means of code messages a long conversation may be carried on.

Progress in Telegraphy and Telephony Last Year.

The annual report of the committee on telegraphy and telephony of the American Institute of Electrical Engineers for the year 1916-17 states that co-operation between the representatives of lighting and power interests and the operators of telephone and telegraph plants, directed toward avoiding hazards and interference, has progressed, and the engineers of these different utilities are becoming better acquainted with the problems involved leading toward the friendly settlement of differences. Specific cases of interference are being met by the application of principles, some of which have been established as the result of experience and others which are in more or less advanced stages of development.

Applications of the developments which made transcontinental telephony possible have been extended so that now the cities of over 50,000 population in the United States, as well as the territory adjacent to them, have been placed in telephonic communication with one another. These improvements which have increased the range of telephone transmission many fold have been made with only slight changes in the lines and equipment and with no change whatever in the subscriber's station apparatus.

In the subject of telegraphy, beyond the increasing use of automatic devices and methods, there have been no new developments completed concerning which reports can be made at this time.

The tendency in radio-telegraphy in its use on ships has been toward standardization in the form of the sets. This is particularly true in the spark type of sets. There has been an increasing use of sustained waves on ship stations. The general service rendered by the ship stations has continued to be of large and increasing value.

The use of sustained waves is increasing. The power required for this method is generated by arcs or by high-frequency alternators either directly or through frequency transformers.

Mr. J. S. Strickler, Western Union Telegraph Company, Leola, Pa., in remitting to cover his subscription for another year writes: "I am pleased to hear you renewed my subscription as the paper is one of my best friends."

MR. JEFF W. HAYES' DEPARTMENT.

The Pleiades Club.

CHAPTER XIX.

There was no great preparation among the whilom dwellers on the planet Mars for their exodus to the planet Jupiter, and the long journey was to be taken without any formality.

Professor Samuel F. B. Morse early indicated his willingness to join the moving multitude and his decision was hailed with delight. Professor Morse was in close conversation with Fred Moxon for several hours prior to the departure.

Mr. Moxon had disclosed to Professor Morse his *modus operandi* of communication with Mother Earth and similar methods were arranged to obtain signals from Jupiter after the arrival of the newcomers on the planet.

It was an unknown and untried field which they were to invade, but, realizing that God was present everywhere, there was no fear in the spirit of the vast throng.

Goodbyes were heard on every side, but there was no sorrow expressed and nothing occurred to mar the serenity and tranquillity of either the travelers or those who remained. It was akin to the experience of passing through the belief of death on earth, for there was no coming back, but onward, upward to God's immortal realm.

The firmament of the planet Mars was interestedly but not anxiously scanned all day for some intelligence from the exodus party, and toward evening of the same day they were rewarded by a flash on the sky, written by wireless pen in the unmistakable chirography of Fred B. Moxon. The message read as follows:

"Greetings from New Providence, Jupiter. God hath wrought wonders and wonderful are his works. We arrived in high spirits, happy, and will give more particulars later.

"Signed, S. F. B. MORSE."

The message occasioned much joy and satisfaction and further news was looked for.

A few hours later the wireless wand began moving again, inditing a long message from Professor Morse as follows:

"Wonderful, wonderful, wonderful! We have just had a visit from Adam and Eve. We have also met Noah, Abraham, Moses, David and Solomon, and this evening we are to have a gathering of the entire family now residing on the planet Jupiter.

"I find the Bible is historically correct as regards the names and doings of the incidents recorded, and everything is very interesting and absorbing to us. We have learned much already, but there is still a great deal more to learn and to prove."

A cry of joy went up from the readers of the message from Professor Morse, many remembering how his first message, "What hath God wrought?" had broken the fetters of time and annihilated space, and now comes a second message to break the shackles of human belief.

All day and evening messages were exchanged between the planets Mars and Jupiter, nothing undergoing censorship.

"Bogy" got in the first deadhead message to the earth. It was addressed to John B. Taltavall, publisher TELEGRAPH AND TELEPHONE AGE, and announced his safe arrival on the planet Jupiter. He did not neglect sending "73" to all of his friends on earth.

Adam sent a message to his children, grandchildren *ad infinitum*. He was at a loss what to say to his posterity on earth, as his legacy to them was a chapter of misery, but "Bogy," with his usual effrontery and nonchalance, remarked, "Why, Grandpa Adam, just do as I did—send them all your '73' "—which was done amid wild applause.

Noah, who was the first shipbuilder we know anything about, was greatly interested in listening to Arthur Copp relate of the era of shipbuilding on earth.

Methusaleh smiled a trifle loftily when Jerry Newton told about the Texas woman who still lives at 130. "She is not my class at all," ejaculated Methusaleh; "she belongs to Esau and Jacob and the younger generation."

Intense interest was manifested when Adam took the floor during the evening for a little talk.

The newcomers are objects of much interest to the old sojourners on Jupiter, there having been no accessions from the earth or Mars for as much as a thousand years, as nearly as anyone could reckon time, there being no established manner of computing the years.

Mark Twain, America's great humorist, was with the new arrivals from Mars and, true to his colors, facetiously asked Nero if he would not play "Old Dan Tucker" on his fiddle, so all could have a dance, and, wonderful to relate, Nero produced the instrument and graciously played the piece.

The last seen of Twain was down at the levee, where he found Samson, the strong man, to whom he related the doings of the latter day gladiators.

Later in the day Professor Morse read a communication from Mother Earth filled with good news from the great war, and there was much rejoicing, even Nebuchadnezzar and Confucius, China's greatest philosopher, showing their interest.

Franklin L. Pope discovered that the telephone was known and worked by the denizens of Jupiter in prehistoric days and it was developed by Charles A. Tinker; that the quadruplex was worked more than ten thousand years ago. These facts, however, should not take any lustre from the endearing names of Morse, Edison, Vail and others, who rediscovered both of these wonderful accessories to human convenience and gave them to the world.

More of these wonderful doings will be told in our next issue.

Following is the remainder of the list printed in the August 1 issue of the names of Canadian operators who have passed away and who have been suggested for admittance to the Pleiades Club:

Cleo C. Young, home town McAlester, Okla., died in Winnipeg, 1913, a first class operator, aged thirty-one; Charles L. Hallett, died in Winnipeg recently, had been in the insurance business for the past twelve years, formerly circuit manager at Fort William, aged fifty-four years. Winnipeg is such a healthy place there are not many applicants for membership in the Pleiades Club; Orville A. Glenn, one of Winnipeg's best known stars, died 1911, aged thirty-seven years. At time of his death he was a member of the grain exchange and doing a lucrative brokerage business; Joseph Quelch, a first class telegrapher and at one time manager of the Dominion Telegraph Company at Montreal in the seventies. He was one of the finest boys one could wish to see; Samuel Ritchie was another of the old Dominion Telegraph boys and was strictly first class; William Duchesmeau, at one time manager for the Canadian Pacific Railroad at Quebec, a fine operator and a good man; John McKenzie, a chief operator for the old Montreal Telegraph Company about the same time, well liked by all; James Poustie, superintendent of construction and maintenance for the old Montreal Telegraph Company; Edward Flanagan, of Prescott, Ont., who died in Utah in the eighties, a fine operator; Robert Empey and Jack Wolfenden, two Canucks, who died in the Far West, both stars; the former would be employed as a comic sketch artist on some metropolitan journal if he were alive today; A. Laurie, a Montreal boy, a fine operator who died in Vancouver in the nineties; Samuel MacIntosh, manager for the Canadian Pacific Railroad at New Westminster in 1887 and later in the insurance business, died there in the nineties; William Fraser, night chief at Vancouver for a number of years, had been in British Honduras and in the Southern States prior to 1890; George Scott, of the Pacific Cable Board, Vancouver, gilt edged, all around, first class man, was in the South African war; J. H. Giffen, lately chief operator at Moose Jaw for the Canadian Pacific Railroad, died in 1915.

More Multiplication.

The Northern Pacific Railroad Company has furnished more capable operators and expert electricians to the country than any other similar corporation.

During the long period of service rendered that company by O. C. Greene, formerly superintendent of telegraph, thousands of operators have graduated as train dispatchers, superintendents, general managers, vice-presidents and presidents of railroads in every section of the country.

It was due to the initiative of Mr. Greene, as far back as 1885, that the duties of testing for wire trouble was taken from the chief dispatcher and given to a trained wire chief. Zones were created, each chief being allotted a certain zone, and the quadruplex introduced at repeating points to handle the through railroad messages.

These innovations were inaugurated by Mr. O. C. Greene, and he was the pioneer of this movement, and was never satisfied with halfway success.

About twenty-five years ago Mr. C. H. Gaunt, now general manager for the Western Division of the Western Union Telegraph at Chicago, became associated with the Northern Pacific Railroad and for thirteen years he continued in the service, the last few years being assistant superintendent, adding yearly to his already well stocked store of knowledge of electrical matters, much of which he acquired from his chieftain, Mr. Greene.

When the time finally arrived which found Mr. Gaunt duly equipped to fill a similar position, the place was open to him, and found him, even as much as he found the place.

Following the example learned from Mr. Greene, while serving the Northern Pacific Railroad, Mr. Gaunt speedily imparted to others the benefit of his experience, bringing to the Santa Fe road such bright lights as Harry C. Chace, George D. Hood, H. D. Teed and several others who have risen to responsible positions with other railroad and telegraph companies.

By teaching these gentlemen the knowledge acquired on the Northern Pacific Railroad, the "Frisco," Chicago, Rock Island and Pacific and the Atchison, Topeka and Santa Fe roads were fortunate in being able to secure the services as superintendent of telegraph these three gentlemen, and thus this endless multiplication goes on.

The three roads mentioned are fully equipped with quadruplexes for the heavy through business, and the zone idea inaugurated by Mr. Greene goes marching on.

I saw Mr. Greene in St. Paul a year ago and found him to be the same intense and earnest man I worked for in 1883.

Like many others who have expressed themselves on the subject, we are all proud and pleased to be able to say that at some time in our lives we labored for O. C. Greene, superintendent of the Northern Pacific telegraph.

LETTERS FROM OUR AGENTS.

New York Western Union.

Mr. J. E. Palmer, father of Mr. G. E. Palmer, chief operator at 24 Walker Street, was retired on pension on August 1, after a service of forty-six years. He is seventy-five years of age.

Mr. J. B. Bertholf, for many years manager of the Jersey City, N. J., office of this company and well known to the members of the New York fraternity, but who retired from active service ten years ago, is recovering from two slight attacks of apoplexy at his home in Monroe, N. Y.

On August 3 the largest volume of business in the history of the office was handled. All previous records were broken.

W. M. Shearman, chief equipment man of the New York main office, has been transferred to the division office in the capacity of division traffic inspector.

The contingent from this office called for government signal service is now stationed at the Monmouth Park, N. J., training camp, undergoing the necessary preparation for more active duties at the front. Warren C. Taylor, a Morse operator, received the highest rank, being commissioned a lieutenant.

The records for the three highest Morse operators in this office for the month of June are as follows: J. Melcer, 84 messages per hour; Mrs. Taylor, 78; and W. C. Smith, 75.

There are 208 students in the Morse school at the present time and there were twenty-five graduated during the previous three months. All of the graduates have received appointments and are working in the operating room and making good records.

Mr. W. R. Taylor, assistant chief operator in charge of the clerical department, is in North Carolina on vacation.

Mr. Joseph Surkin, of the Commercial News Department, has been detailed to Hartford, Conn., on special service.

Jack C. Robb, a well-known old time member of the telegraph profession was a New York visitor this week while on his annual vacation. For several years past he has been identified with the oil business and is now with the Gulf Refining Company of Lousiana and located at Shreveport, La. Mr. Robb in the late seventies and early eighties was a member of the telegraph force in New York City and he has worked in almost every telegraph center in the country. His New York friends were glad of the opportunity to greet him on his recent visit.

Boston Western Union.

Traffic Superintendent S. B. Haig spent August 9 and 10 in Boston on company business. While here he made an interesting address to the Morse and multiplex schools, outlining to the students many of the features of a career in the Western Union service.

Repeater Chief M. C. Harrington is confined to his home on account of illness. A. B. Kurtz is assisting in the repeater department during Mr. Harrington's illness.

Girls have been born in the homes of Supervisor A. C. Dunn and Eastern Wire Chief C. E. Perkins.

Clarence Martin, son of Night Chief Operator W. E. Martin, has joined the colors and is stationed at the Charlestown Navy Yard, Signal Corps.

The Reverend J. D. Budds, of Charleston, S. C., a brother of Repeater Attendant W. T. Budds of this office, died on August 4. Mr. Budds had just recently returned to Boston from Charleston, where he had visited his sick brother.

Philadelphia Postal.

Chief Operator E. W. Miller has returned from vacation at the shore and George Kohlbrenner of Superintendent Bagley's office has also returned from a vacation.

Among those who are enjoying their holidays are Night Chief Operator J. A. McNichol, Miss H. Finan of our telephone department; D. H. Gage, Jr., and K. L. Vernon of the electrical engineers department.

Pocatello (Idaho) Western Union.

This little city received its name from an old Indian warrior, famous in the early history of Idaho. It is an ideal place for the hunter and fisherman, and here also the sick may come and be restored to health and vigor. The people of this state are open-handed and generous; a trifle rough perhaps as would be the case in associating with "diamonds in the rough." The Pocatello Western Union office is in charge of E. A. Talcott, who is well known in the Mountain Division, having been manager of several different offices in this division.

Arthur W. Hayes, chief operator, graduated from the Salt Lake office, where he served for several years as supervisor, and he is well qualified to fill his present position. G. F. Stephens, night chief operator, is an old-timer, handy with the "bug" and the "mill." P. R. Berry works the Salt Lake bonus wire and keeps the hooks clear when he's on duty.

It is very pleasant to visit this little oasis and my stop in Pocatello will long be remembered.

Miss Gudrun Hillewick has just been added to the traffic department of the Salt Lake office.

St. Louis Western Union.

F. P. Mullen, assistant chief operator in charge of the automatic division, has returned from a two weeks' vacation.

The St. Louis unit of the Tenth Reserve Battalion of the United States Signal Corps departed at 7 p. m., July 20, for Leon Springs, Tex., where they will join the other units. Most of the seventy men in the unit are employes of the Bell Telephone Company. The following men were Morse operators from the Western Union main office here: Oliver Duncan, James Price, E. T. McIver, Nathaniel Horowitz, Wm. H. Frohoff, F. G. Stubblefield, Edw. Bloss and Paul James.

A Letter of Appreciation.

The publisher of TELEGRAPH AND TELEPHONE AGE is highly pleased with the warm and heartfelt expressions of good will received on the commemoration of the thirty-fifth anniversary of the paper's existence, and it is with a deep sense of gratitude that he acknowledges the receipt of so many messages of love and cheer. It was indeed a surprise to him to learn how firmly the paper and the desire for its welfare are entrenched in the hearts and minds of the telegraph profession, and these letters have given him new life and encouragement to continue the work to which he has devoted the greater part of his life.

The letters received are highly eulogistic and spontaneously warm and are greatly cherished. So many have been received that we find it would be quite impossible to print a full list of them in the columns of TELEGRAPH AND TELEPHONE AGE, so we therefore tender acknowledgment through the medium of this letter, and give the names of a few of those who have so kindly sent in their congratulations: A. C. Terry, division commercial manager, Western Union Telegraph Company, Pittsburgh, Pa.; J. J. Ross, superintendent telegraph, Michigan Central Railroad, Detroit, Mich.; Patrick B. Delany, electrical engineer, Nantucket, Mass.; Lieutenant P. J. Tierney, government cable censor, New York; F. S. Work, Warwick, N. Y.; W. L. MacLellan, New York; J. Frank Howell, president, Consolidated Stock Exchange, New York; W. O. Snyder. Bridgeport, Conn.; G. D. Hood, superintendent telegraph, Chicago, Rock Island and Pacific Railway, Chicago, Ill.; Walter P. Phillips, Bridgeport, Conn.; A. S. Weir, Philadelphia; G. O. Perkins, superintendent telegraph and signals, Chicago

Great Western Railroad, Chicago; W. P. Cline, superintendent telegraph, Atlantic Coast Line Railroad, Wilmington, N. C.; G. H. Groce, vice-president, McFell Signal Company, Chicago; W. H. Sawyer, retired, Providence, R. I.; Wm. de la Motte, retired, Red Bank, N. J.; R. W. A. Horner, chief operator, Western Union Telegraph Company, Lynchburg, Va.; G. H. Sickles, Associated Press, Philadelphia; Thomas A. Edison, Orange, N. J.; I. D. Hough, superintendent telegraph, El Paso and Southwestern System, El Paso, Tex.; M. H. Clapp, superintendent of telegraph, Northern Pacific Railway Company and president of the Association of Railway Telegraph Superintendents, St. Paul, Minn.; E. W. Collins, general superintendent, Postal Telegraph-Cable Company, Chicago; Chas. Bright, London, England; F. V. Moffit, formerly manager of the Chicago Western Union office, now of Omaha, Neb.; H. P. Wagner, Chicago; R. R. Hobbs, superintendent of telegraph, Louisville and Nashville Railroad, Louisville, Ky.; L. J. Mackey, assistant to president of the Evening News Printing Company, Franklin, Pa.; H. F. Dodge, division traffic supervisor, Western Union, Chicago, together with fully one hundred New York telegraph and telephone officials and operators.

POCKET EDITION *of* DIAGRAMS *and* COMPLETE INFORMATION *for* TELEGRAPH ENGINEERS *and* STUDENTS

By WILLIS H. JONES, New York

A new edition of "Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students," by Willis H. Jones, price $2 per copy, was issued on April 1 this year. It is practically the same as the edition of the book issued two years ago with an added appendix of twenty-four pages descriptive of the Western Union Multiplex System, which is now so extensively used in this country and which has been adopted by the English Telegraph System. This brings this most valuable of all telegraph engineering textbooks up to date and we hope that many orders may reach us from all sections of the country for copies of the book.

If you have a 1915 edition, all that is needed is a copy of the pamphlet descriptive of the Western Union Multiplex System, price 35c., to bring your book right up to date.

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NEW YORK, SEPTEMBER 1, 1917.

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Renewal of Subscriptions.

A trade publication like TELEGRAPH AND TELEPHONE AGE is considered fraternal in character, and for that reason when a subscription expires it is promptly renewed so that its receipt may be continuous. Some publications stop a paper when the subscriptions expire, with the result that this action causes many to ask if the publisher was afraid to trust them for an extra issue or two until they could make it convenient to remit to cover a renewal. This is unnecessary friction that we have always aimed to avoid. We therefore prefer to continue sending the paper until we are advised by postal card or letter that it is no longer required. While our action in this respect may not please a few in the course of a year it is satisfactory to ninety-eight per cent. of our readers.

Telegraph and Telephone Age on Torpedoed Steamer.

Our issue of February 16 mailed to a large portion of our European subscribers was lost when the steamer "Laconia" was torpedoed and sunk about February 23. Every foreign mail now brings complaints from our foreign subscribers of non-receipt of this issue.

We are prepared, however, to fill in the missing numbers and we ask those who need that particular number to complete their files to send us a postal card requesting a copy.

Shortage of Operators.

The telegraph business has doubled within the past three years and is still rapidly increasing, while the manual facilities for handling it have been seriously impaired by the demand made upon the telegraph forces for men for military purposes. The Western Union Telegraph Company has so far lost 500 operators and the Postal Telegraph-Cable Company 200, but both companies are struggling courageously to keep their business moving, and are pressing into service every retired old-timer who can and is willing to help them out in the emergency. There is great activity, too, among the telegraph schools, but necessarily this source of supply of good operators is comparatively slow in results; but everything helps.

President Newcomb Carlton of the Western Union Company says: "We are making the best of a very difficult situation. Many of our men are doing more work than would ordinarily be required, but these men who remain at their accustomed posts to do their bit are the mainstay in support of the military operations and they are the real patriots. They are sharing the extra task cheerfully and in the spirit that it is for a patriotic cause."

Vice-President C. C. Adams of the Postal Company thinks the government ought to release and exempt all telegraph operators from military service for the reason that the telegraph service is essential in the conduct of the war and is so largely needed by the government at this time.

Articles on Efficiency Engineering.

Our articles on "Efficiency Engineering in the Telegraph Service," which form a feature of each issue of this paper, are attracting wide attention for the valuable and common sense information they contain, and, judging from the number of commendatory letters received at this office regarding them, the advice is working to the good of the business. The short articles on "Shop Talk" by "The Observer" are also highly appreciated, and one writer says: "It is regrettable that so many are indifferent to the suggestions your paper is continually making. Office cleanliness," he says, "cannot be too strongly urged."

One of the most striking features of these articles is that they state the most obvious facts in so clear a manner that many people wonder that they have to be told at all, yet it is one of the odd things about the human mind that the simplest facts are the ones most overlooked.

Everyone in the telegraph and telephone services should carefully study these articles, as they are of real practical value, and the advice they give is applicable in any line of activity.

How Old Timers Can "Do Their Bit."

Many old time telegraphers, a number of them retired, have written to us asking how they can be of service to the country in the present emergency. We referred the matter to Brigadier-General George O. Squier, Chief Signal Officer, Washington, D. C., who replied as follows:

"While the patriotism displayed by the persons whom you have mentioned in your letter is noteworthy, there does not seem to be any way where their services could be utilized by this branch of the service at this time. If these men who are incapacitated for the regular army service could in any way assist the commercial companies in keeping up the internal lines of communication throughout the country, they would be rendering a patriotic service to the country and it is suggested that they offer their assistance to such organizations."

Naturally civil war telegraphers would like to get where they can smell powder again, but as they are well advanced toward the finish of the battle of life this privilege must be denied them on account of their age. They can, however, help their country by volunteering to fill the places of the young men in the telegraph service who have been called out to the colors. It is indeed an honor and a privilege, to be able to do telegraph work under these circumstances.

Telegraph and Telephone Patents.

ISSUED JULY 24.

1,234,134. Loud Speaking Telephone System. To J. J. Coner, Chicago, Ill.

1,234,187. Telephone Exchange System. To A. E. Lundell, New York.

1,234,246. Telephone Exchange System. To J. L. Wright, New York.

1,234,524. Quadruplex Telegraph System. To C. G. Ashley, Toronto, Ont.

1,234,610. Automatic or Semi-Automatic Telephone Exchange System. To G. A. Betulander and N. G. Palmgren, London, England.

1,234,613. Telephone Instrument. To G. Boissonnault, New York.

1,234,623. Telephone System. To L. C. Bygrave, London, England.

1,234,649. Telephone Transmitter. To J. P. Ferriter, Peters, Fla.

1,234,650. Buzzer Transmitter. To J. P. Ferriter, Peters, Fla.

1,234,651. Telephone Talking Coil and Circuit Connections. To J. P. Ferriter, Peters, Fla.

ISSUED AUGUST 7.

1,235,599. Telephone Exchange System. To F. N. Reeves, New York.

1,235,688. Telephone Exchange System. To E. E. Hinrichsen, New York.

1,235,705. Telephone Exchange System. To A. E. Lundell, New York.

1,235,748. Printing Telegraph. To C. J. Wiley, Yorktown, N. Y.

1,235,848. Telephone System. To C. A. Simpson, Chicago.

1,236,024. Combined Cutout and Lightning Arrester for Telephone Systems. To H. S. Wheaton, Dallas, Iowa.

1,236,103. Telephone Instrument. To H. G. Pape, New York.

1,236,128. Relay. To D. P. Williams and J. F. Williams, New York.

Stock Quotations

Following are the New York closing quotations of telegraph and telephone stocks on August 28:

American Tel. and Tel. Co.	118⅜
Mackay Companies	80¼-82⅛
Mackay Companies, pfd.	64-64½
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2½
Western Union	92⅞

The Purchase of Stock.

Whenever there is a decline in prices of stocks, readers in all sections of the country write us in regard to investments. For many years we assumed the trouble of purchasing stock for members of the profession and we have purchased as much as $30,000 worth in one month. It was difficult, previous to ten years ago, to find a broker that would bother to handle small lots of stock. The influence of this paper was used to the limit to persuade New York bankers and brokers to recognize the advisability of catering to the business of the one to five-share purchasers. We argued that a man who wished to purchase from one to five shares of stock was entitled to the same consideration as the millionaire who purchased stock in lots of 5,000 to 10,000 shares. We always did this service without compensation. In fact, in every case we had to bear the expense of postage, which was no small item.

Things are different now and banks in all sections of the United States will be glad to purchase stock through their New York connections for railroad, telegraph or telephone people residing at distant points. This work can be done just as well through a local bank as it can be by us. We have been anxious for some time to rid ourselves of this particularly responsible task and we hope our friends everywhere who have been accustomed to do their purchasing of stock through this publication will hereafter patronize their local banks and thus relieve us of the burden which we were willing to carry as long as purchases of stock could not be made by people residing at a distance through their own local financial institutions.

PERSONAL.

Mr. E. R. McFarland, superintendent telegraph and telephone, Alaskan Engineering Commission, Anchorage, Alaska, has resigned to accept a captain's commission in the Signal Officers' Reserve

Mr. Seikichi Miyai, electrical engineer to the Imperial Department of Communications, Tokyo, Japan, is in New York acquainting himself with our modern systems of telegraphy and telephony, with the purpose of introducing into Japan such methods as are adaptable to the service in that country.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. Edward Reynolds, vice-president and general manager, returned to his office on August 27 much improved in health after his three weeks' rest from business cares.

Mr. Chas. C. Adams, vice-president, will begin his vacation on September 1 at Richfield Springs, N. Y., where his family has been located for the summer.

Mr. W. I. Capen, vice-president, has returned to New York from a general inspection trip through the Pacific Division.

Mr. F. C. Lacey, manager at Asbury Park, N. J., has been promoted to the managership at Waterbury, Conn., vice Miss M. M. Hunter, resigned.

Mr. F. W. Samuels, formerly manager of the Indianapolis, Ind., office, is reported to be seriously ill at his home in that city.

Headquarters Changed.—The headquarters of C. A. Richardson, superintendent, second district, Eastern Division, were removed on September 1 from New York City to No. 90 State Street, Albany, N. Y., in the same building as the company's main office in that city.

Managers Appointed.—L. R. Small, at Sioux City, Ia.; L. L. Kerr, Flint, Mich.; M. O. Egstrom, Sioux Falls, S. D.; R. J. Westfield, Janesville, Wis.; G. Hardgrove, Ashland, Ohio; H. M. Rowland, Henderson, N. C.; Robert Hatch, Reidsville, N. C.; J. P. Lewis, Suffolk, Va.; J. B. Clark, Great Falls, Mont.

A Letter of Appreciation.

In our August 16 issue we printed a partial list of names of prominent telegraphers, ex-telegraphers and others who had sent us special congratulations on the thirty-fifth anniversary of the existence of this paper. Many other letters have been received, and we print below a few names of the writers, expressing at the same time our appreciation for their kind words:

Donald Murray, inventor of the Murray Printing Telegraph System, London, England; M. T. Cook, general manager, Western Union Telegraph Company, San Francisco, Cal.; J. B. Coggins, manager, Postal Telegraph-Cable Company, San Francisco, Cal.; C. W. Pearson, manager, Postal Telegraph-Cable Company, branch office, New York; D. C. Donohue, in charge Bureau Fire Alarm Telegraph, Borough of Richmond, Staten Island, N. Y.; F. C. Hackett, formerly manager of the Cleveland, Toledo, Pittsburgh and other offices of the Western Union Telegraph Company, now in outside business and located at Toledo, Ohio; J. W. Laughlin, in charge of the government telegraph system at New Orleans, La.; and Hugh McPhee, district commercial superintendent, Western Union Telegraph Company, Los Angeles, Cal.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Mr. Newcomb Carlton, president of this company, has returned from a journey to the Pacific Coast. He was accompanied on the trip by several business friends.

Messrs. Lewis McKisick, assistant to the president, and W. N. Fashbaugh, vice-president in charge of traffic, are spending their vacations in Colorado.

Mr. J. C. Willever, vice-president in charge of commercial department, is again at his desk after a vacation spent in touring the New England States by automobile.

Mr. J. T. Warner, formerly chief clerk to Superintendent J. F. Wilson, Meridian, Miss., has been transferred to the position of chief clerk to Division Plant Superintendent J. L. Ord, San Francisco, Cal.

A False Report With Wings.

A report has been published broadcast lately to the effect that the Appellate Term of the Supreme Court had decided that a telegraph company can legally refuse to accept a message for transmission unless the exact amount of the charge is tendered. The case was that of Francis C. Dale against the Western Union Telegraph Company, and the suit was brought because one of the company's offices was unable to change a $5 bill and refused to send the message. The first report was wrong. The case was not closed with a verdict in favor of the plaintiff as stated, but was passed on to the Appellate Division where the action is yet to be heard.

We mention this case particularly merely to show how rapidly and widely a false report spreads. One New York newspaper printed a correction the day following the announcement of the original report, but practically every other newspaper has ignored the correction.

Have an Aim.

The trouble with most youths is that they are not half committed to their career. They are too easily detached from their life-work by discouragement or outside influence. A man never amounts to much until he has a life aim, until he burns all bridges behind him and commits himself with absolutely no reservation to his work.—*Marden.*

THE CABLE.

Mr. J. Lister, district cable manager, Western Union Telegraph Company, Boston, is in New York on his vacation.

Communication Restored.—Cable communication with China, the Philippine Islands and Dutch East Indies, via San Francisco, has been restored.

Cablegrams to China.—Announcement comes from China that telegrams from or to German, Austrian or Hungarian subjects are not admitted. All private code telegrams sent by foreigners must bear the stamp of respective consulates at localities of origin to certify that the contents relate to commercial or private business. Private code telegrams sent by Chinese must be stamped by local government offices or Chambers of Commerce.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to August 27 as follows:

Azores and Emden (two cables), August 15; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable) October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917.

CANADIAN NOTES.

Mr. A. D. Campbell, chief operator of the Great North Western Telegraph Company, Winnipeg, Man., is taking an extended vacation in California for the benefit of his health.

Mr. George Bott, son of H. Bott, inspector, Canadian Pacific Railway Company's Telegraph, has been promoted from sub-lieutenant to full lieutenant in the British Navy, and is now attached to the submarine service.

THE TELEPHONE.

Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company, has returned from a trip to California. He afterwards spent a few days in Washington at a meeting of the Wheat Price Fixing Commission, of which he was recently appointed a member.

Dr. John J. Carty, chief engineer of the American Telephone and Telegraph Company, is one of the incorporators and first members of the American Academy of Engineers, for the incorporation of which a bill is to be introduced in the Senate at Washington. The measure provides for the establishment of a body of representative engineers upon whom the government may call for advice in time of need.

Infection by Telephone.—An old lady in England, an invalid, would not have a telephone installed in her home because of her belief that infection could be carried over telephone wires.

The Cumberland Telephone and Telegraph Company is laying a cable from Gulfport, Miss., to Ship Island and the Chandelier Islands.

Telephone Medal.

At the first public exhibition of the telephone at the American Institute Fair, on Third Avenue, New York, in 1877, Doctor Alexander Graham Bell was awarded a medal. Mr. J. G. Case, the old-time telegrapher and official, now living in retirement at Brook Farm, Kirkville, N. Y., was chairman of the board of judges. Mr. Case is under the impression that this is the first medal ever awarded the telephone. His colleagues on the board at the time are now all dead.

The Telegraph and Telephone in War Plans.

Mr. W. S. Gifford, director of the Council of National Defense, Washington, D. C., in a statement issued August 19 summarizes the achievements of the council and its advisory committee. Regarding the telegraph and telephone work Mr. Gifford says: "Through the efforts of the members of the Telephone and Telegraph Committee, the communication lines of the entire country have been put at the government's service, and are now being centrally directed with war needs primarily in view. Not only have government messages been given preference over commercial wires, but thousands of miles of new wire and thousands of new switchboards have been and are still being installed to take care of the greatly increased demands of the nation."

Mr. Gifford was statistician for the American Telephone and Telegraph Company at New York at the time he received his government appointment.

Mr. Vail on Farm Work.

Mr. Theo. N. Vail, president, American Telephone and Telegraph Company, is the author of an article in the *Agricultural Digest* entitled "What Farm Women Can Do to Help Win the War."

"The solution of the labor question on the small farm, temporarily at least," he writes "is the planning of the work in order to effect the largest result with the least labor. When the work gets heavier or needs two or more working together or a larger force of workers, neighborhood co-operation will help solve the problem. A few more daylight hours and the women and children enlisted in the lighter temporary work well suited to their physical ability will give astounding results.

"If these things were done, as they should be done now of all times, there would be little complaint of hard times or lack of profit on the small farm."

Swearing by Telephone.

Swearing by telephone is not permissible. This rule relates not to profanity, but to the administering of oaths. A lawyer, who was also a notary public, having before him a proposed affidavit, which purported to have been signed by a certain person, called the party up on the telephone and after swearing him, over the wire, proceeded to so certify over his signature and official title. The Appellate Division of the New York Supreme Court severely censured the attorney as guilty of a serious offense, amounting to professional misconduct, and termed the act, moreover, a misdemeanor.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager, Marconi Wireless Telegraph Company of America, and Mr. David Sarnoff, recently spent two days at Washington in conference with the Navy Department.

Mr. W. A. Winterbottom, division superintendent, San Francisco, has returned from the Pacific Coast and taken up special duties at the executive offices, New York.

Mr. E. T. Edwards, superintendent, spent his vacation at Seagate, L. I., where he has a fine home.

Mr. Harold E. Dunn, factory manager, Marconi Company of Canada, Montreal, was a recent New York visitor.

Long Distance Wireless Signals.

Wireless service between the Japanese station at Funabashi and San Francisco is carried on generally through the intermediary of the Honolulu station in the Hawaiian Islands, although signals are frequently received direct from Japan with considerable strength.

Signals from the Funabashi station have been heard as far as Clifden, Ireland, and it is believed that excellent signals are heard in Australia.

Tall Wireless Masts at Funabashi Wireless Station.

The powerful wireless station at Funabashi, near Tokio, Japan, is within full view of the famous extinct volcano Fujiyama, the buildings and masts covering an area of about 110 acres. There are nineteen masts, the tallest being over 200 meters in height. This mast is in the centre of a ring of eighteen 60-meter masts, which support a giant umbrella aerial. These outer masts are placed equidistant from one another and some 400 meters from the central tower.

Anchorage Wireless Station.

A permanent wireless station, to replace the temporary plant now in operation, is being erected by the Alaskan Engineering Commission on Government Hill, overlooking the Anchorage terminal yards.

The new installation involves the erection of two 200-foot fir masts, a six-wire aerial and a building twenty-seven by twenty-seven feet. The building will contain an operating room, generating room and living quarters for two men. A 2-k. w. 500-cycle transmitting apparatus and one of the latest types of receiver with supersensitive audion detectors and amplifiers will be included in the operating equipment.

The apparatus now in use has an operating radius toward the sea of about 500 miles—sufficient to communicate with Kodiak, the Alaskan peninsula and boats off the inlet.

Radio Companies for War Service.

Two radio or field telegraph companies have been recruited by the Western Electric Company and have gone into the Signal Corps Reserve for intensive training.

Wireless telegraph in one form or another, says the *Western Electric News,* is often the only communication that can be maintained during bombardments, so that its use has spread into the very front trenches, and portable sets have been developed which can be carried by men detailed from attacking parties to report back the progress of the attack and direct the supporting artillery fire.

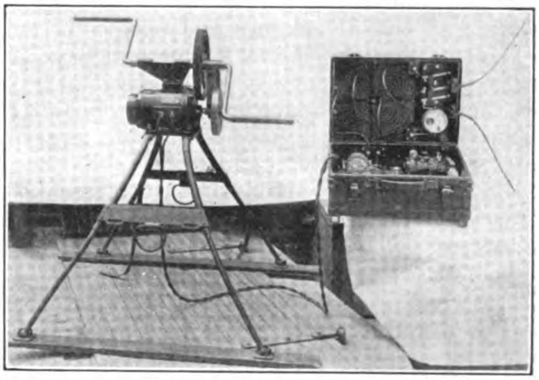

FIG. 1—PACK AND HAND DRIVEN GENERATOR.

Previous to the present war the General Staff of the United States Army, in common with that of most other armies, planned the organization of their signal service on the basis of open field warfare, such as was carried on in the present war up to the battle of the Marne, and the organization and duties prescribed for a radio company in the

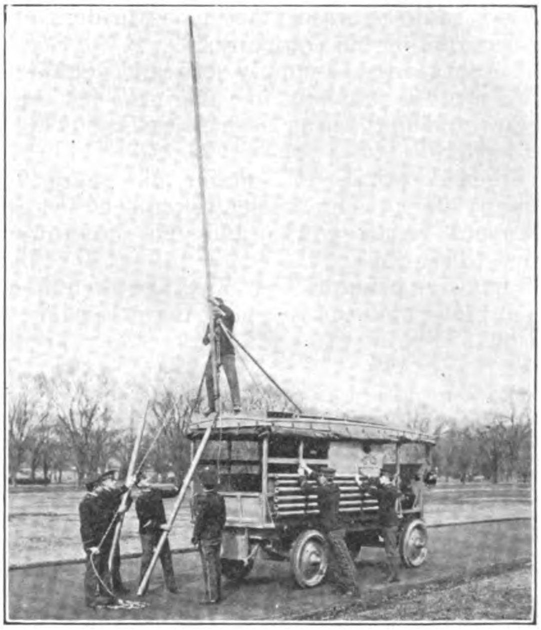

FIG. 2—ERECTING A MAST ON A TRACTOR.

manuals are still such as bear principally upon such a campaign. However, the development of radio wireless telegraphy has been so rapid and the conditions of trench warfare have so changed preconceived ideas of the functions of signal troops, that it is probable that the Signal Corps of the American army in France, and particularly the radio companies, will have to undertake, in addition to their present prescribed duties, new and novel services requiring kinds of equipment different from that already in use, and perhaps changes in internal organization, as well as in their relation to other branches of the army.

It is quite possible, for example, that the use of wireless and wire telephones and telegraphs will be so extensive that the Signal Corps will have to act in a general supervisory or staff capacity, as well as in their present capacities; that is, beside their present duties they will have to educate large numbers of men in the other branches of the other service in the use of Signal Corps instruments, and oversee their use, acting as a storekeeping and maintenance department for this class of apparatus for all branches of the service.

Personnel of a Radio Signal Company.

A radio company of the Signal Reserve Corps is commanded by a captain and is composed of the following personnel: A captain and two first lieutenants, mounted.

The enlisted men are a master signal electrician, technical expert of the radio company, in charge of making repairs and adjustments to wireless telegraph apparatus.

Six sergeants, first class; one assists the captain, handling questions of supplies, finances, etc., and five radio operators acting as leaders of the five sections of the company.

Nine sergeants—a supply sergeant, a stable sergeant, a mess sergeant, one engineer for the gas engines and five acting as first assistants to section leaders.

Fifteen corporals, one farrier, one saddler, one company clerk (office work), two mechanics (miscellaneous repair work) and ten operators assigned to sections.

Thirty-five privates, first class; two trumpeters, two drivers and thirty-one privates assigned to sections. Six privates, one horseshoer and two cooks.

All are mounted except one mess sergeant, two mechanics and two drivers. The arms carried are automatic pistols.

MUNICIPAL ELECTRICIANS.

Captain George E. A. Fairley, principal assistant engineer to the Municipal Electrical Commission of Baltimore, Md., has received a commission as captain in the Engineer Corps of the United States Army. Captain Fairley did not attend any of the training camps. He volunteered as an electrical engineer. He is a member of the executive committee of the International Association of Municipal Electricians; consulting subway engineer of Erie, Pa.; an associate member of the American Institute of Electrical Engineers, and of the National Electric Light Association. He hopes to be able to attend the annual convention of the International Association of Municipal Electricians, which is to be held at the International Hotel, Niagara Falls, N. Y., September 11, 12, 13 and 14.

The Convention of Municipal Electricians.

As the time draws nigh for the annual convention of the International Association of Municipal Electricians at Niagara Falls, N. Y., September 11, 12, 13 and 14, the final details for the work of the meeting and the entertainment are being rapidly arranged, and Secretary Clarence R. George is kept extremely busy to keep all the forces strictly in line. Papers of extraordinary importance and interest have been arranged for to be presented at the convention, and Secretary George urges the members to come to the meeting prepared to take an active part.

Mr. M. J. Donohue, city electrician of Niagara Falls, is at the head of the committee of entertainment and exhibits and as far as the entertainment is concerned he promises a satisfactory programme. Space for exhibits will be provided free of charge, and any one desiring to make a display is requested to communicate with Mr. Donohue.

This will be the twenty-second annual convention of the Association and will be held at the International Hotel.

OBITUARY.

G. C. Blickensderfer, aged sixty-six years, inventor of the Blickensderfer typewriter and other mechanical devices, and who was well known to the telegraphic fraternity, died at his home at Sound Beach, Conn., August 15.

Miss Kate Collins Brown, who was a niece of the late Perry McDonough Collins, organizer of the Overland Telegraph Company, which was in course of construction to connect the United States with Europe via Alaska and Siberia when the Atlantic Cable proved a success in 1866, died in New York City, August 19.

Paul Leloup, aged sixty-two years, one of the oldest and best known telegraphers in New Orleans, La., died August 9. Mr. Leloup had been identified with the Western Union service for upwards of forty years until his retirement on a pension a year ago. He was manager of the Cotton Exchange office. He was a brother of the late Edward Leloup, who occupied important telegraph positions in the Crescent City since the close of the Civil War.

Assessments. — The Telegraph and Telephone Life Insurance Association has levied assessments 625 and 626 to meet the claims arising from the deaths of S. W. Eldredge, at Boston, Mass.; W. W. Beachboard, Philadelphia, Pa.; A. K. Ingraham, Bridgeport, Conn.; R. F. Mack, Kansas City, Mo.; E. A. Burns, Philadelphia, Pa.; G. A. House, Cohoes, N. Y.; W. T. Clark, Newark, N. J.; R. S. Titus, Bayonne, N. J.; C. O. Blake, Nevada, Mo.

Consolidation and Simplification of Signal Codes.

Lieutenant-Colonel B. O. Lenoir, of the Signal Corps, is the author of an article in the *Army and Navy Register* for July 14 in which he discusses the subject of signaling in the army and argues in favor of its simplification.

"When a man enlists in the Signal Corps," he says, "he is confronted with learning all the duties of a soldier—the drill, care of horses, and numerous other duties, and of course the profession of the signalist, as he belongs in the Signal Corps.

"In civil life it requires several years to master the profession of the expert telegrapher, even when the mastery is the sole object to be attained; it also requires natural talent, for if it is lacking, expertness will never be attained, i. e., the art of sending and receiving thirty to forty-five words per minute without thinking about it, and turning out perfect copy without corrections.

"In fact, he who thinks is not an expert, for there is no time to think, as it must be done after practice so long and constant that it is done entirely by intuition.

"But in the Signal Corps, in addition to numerous duties, the recruit must learn four signal codes or languages, i. e., the American Morse Code, the International Morse Code, the General Service Code, and the Semaphore Code; quite a Herculean task if it is done properly. It is no wonder that civil experts who carry on the signal business of 100,000,000 people and the press news of the country balk at the idea of being reduced to recruits in three additional signal languages.

"The reason why such expertness exists in civil life is because there is much practice and a concentration on a single code, and similar tactics in the army will be attended by similar results.

"The common law signal language in the United States and Canada is the American Morse Code, used by one-quarter million of the most expert signalists on earth, and there seems to be no reason why this common law signal language should not be adopted in the army for all signaling, and advantage taken of the expert talent that exists in the United States, and which is an immovable and permanent and invariable standard for all signalists to follow, for every class of signaling can be done with the American Morse Code. There is no reason to depart therefrom and lose the advantage of the best precedent, and risk confusion by adopting something different."

"It is dangerous to depart from the practice of the art as developed since the days of Professor Morse," continues Lieutenant-Colonel Lenoir. "The constant use of his code has developed a degree of efficiency that cannot even be imagined by those who are not his ardent disciples. Some of the brightest minds in the country have passed through his school of practice, and his graduates are numbered among all the arts and sciences, lawyers, doctors, finance, professions and business. Some of the largest railroad systems in the country are run by them, and other large businesses are operated by those who have served as disciples of Professor Morse. For this reason little attention should be given to those new in the art who are constantly demanding changes with a view of discovering some short cut to make efficient signalists, for until a man has actually become an expert he should not be heard on the subject of changes, but when once intuitively learned, all supposed defects vanish, just as in learning to talk."

Lord Kelvin.

One of the most important figures in the world of electric invention was Lord Kelvin, English physicist and philosopher, and the present and future generations of telegraphers should know about his achievements. He solved almost all the problems of submarine telegraphy. Not very many people are familiar with the history of this remarkable man, who died at his residence, Netherall-near-Largs, Scotland, on December 17, 1907.

He was born William Thomson June 26, 1824, at Belfast, Ireland, the second son of James Thomson, a teacher of mathematics in the Royal Academical Institution. At the age of ten William Thomson matriculated in Glasgow University, and when he was twenty-two years old he accepted the chair of natural philosophy in that university. This he held for fifty-three years, attaining universal recognition as the greatest physicist of his time.

Since 1854 Lord Kelvin was most prominent among telegraphers. His remarkable researches gave to the world the mirror galvanometer, the syphon recorder, the stranded form of conductors and many other important parts of submarine telegraphy. His work in connection with telegraphy led to the production in rapid succession of instruments for the measuring of electricity.

Current from the ten-thousandth of an ampere to 10,000 amperes and pressure from the fraction of a volt to 100,000 volts are measured by his instruments.

Lord Kelvin ranks with the big men who have done big things to broaden the fields for the use of electrical energy. It has been said that his wonderful personality and the kindly encouragement he gave to students and others who came in contact with him have done more for the progress of physical discovery during the nineteenth century than the efforts of any other one man.

In acknowledgment of his services to transatlantic telegraphy Thomson was knighted in 1866, and in 1892 he was raised to the peerage, with the title of Lord Kelvin, Baron of Largs. During his life many thousands of degrees and honors were bestowed upon him for his inventions and his additions to electrical science.

A remarkable demonstration in honor of Lord Kelvin was held at Glasgow University in 1896, the jubilee of his professorship. More than 2,500 scientists and members of the nobility gathered to honor the distinguished man. One of the features of the three-day celebration was a message sent through Newfoundland, New York, Chicago, San Francisco, Los Angeles, New Orleans, Florida and Washington. It was received by Lord Kelvin seven and a half minutes after being dispatched, having traveled more than 20,000 miles and twice crossing the Atlantic Ocean during the interval.

History of the Speedwell Iron Works.

BY J. C. VAIL, MORRISTOWN, N. J.

Morris County, New Jersey, of which Morristown is the county seat, has long been noted for its production of iron, the Dickerson mine having been purchased by John Reading in 1714.

Early records show a forge at Whippany, near Morristown, followed soon after by others, one of which was located at Speedwell, where, soon after the Revolutionary War, Kinney and Arnold established a "slitting" mill.

This enterprise not proving a success, Stephen Vail acquired a one-half interest in 1807 and the other one-half in 1822.

Vail had established a reputation in his line, so that in 1818 he undertook and completed the engines of the "Savannah," the first steamship to cross the Atlantic, it going in 1819 from New York to Savannah, Ga., and from that city to Europe as far as Russia, and on its return her captain said "not a bolt was loose."

On September 2, 1837, Alfred Vail, son of Stephen, saw the crude "Morse telegraph" instrument and agreed to "construct and put into successful operation, at his own proper cost and expense, one of the telegraphs of the plan and invention of Morse."

And he also agreed "that in case either of the parties to the contract shall make any new discoveries . . . or any new invention" such new discoveries or invention should be shared under said "articles of agreement." This was dated September 23, 1837.

On September 9, 1837, Alfred came home with the new idea and, securing the use of his father's facilities and bank account, proceeded to work out the production of a commercially successful machine, being assisted by William Baxter, who afterward became an inventor of note.

Morse came out, as recorded by S. Vail in his journal on October 28, 1837, "to paint Mrs. Vail's and my portrait." Morse came out several times between this and January 1, 1838, when he appears to have remained until January 6, when S. Vail records "The magnetic telegraph is in operation for the first time in the factory," followed on January 11 by "hundreds came to see it work."

S. Vail conducted the works until about 1853, when he was succeeded by his son George, in partnership with Isaac Canfield, a grandson, which firm continued until succeeded by Canfield and Lidgerwood.

The smallness of the water power and increased cost of cartage obliged the closing of the works about 1873, and the business was taken over by the Lidgerwood Manufacturing Company, who moved their plant to Brooklyn, N. Y. This closed the old "Speedwell Iron Works" forever.

At the present day a few ruins only remain, the brick gable ends of the old machine shop and the walls of the "office" being the principal relics still standing.

VIEW OF SPEEDWELL IRON WORKS, MORRISTOWN, N. J., WHERE THE ORIGINAL TELEGRAPH INTRUMENTS WERE MADE.

The old factory where the telegraph experiments were conducted, and around the walls of the second-story room of which two miles of wire were strung for the exhibitions of January 6 and 11, 1838, still stands on the Vail homestead grounds in a fair state of preservation.

The city of Morristown has lately acquired the site of the "Works" and the land covered by the water rights and intends to make a Speedwell Park, which will tend to preserve this site, made historic by its connection with the "Savannah" and the telegraph.

These important steps in the progress of mankind should induce all scientific and historical associations to mark their appreciation in some way of the work carried on at this spot in the early days of the last century.

I would add that S. Vail was a partner of Baldwin, the founder of the Baldwin Locomotive Works, and that some of the necessary machinery was constructed at Speedwell.

The Outlook for Overland Radio Communication.

BY PHILIP E. EDELMAN.

Despite discouraging war conditions which have temporarily checked development of radio communication for land service, a number of public service companies are considering the use of radio equipment for load dispatching. One of these, the Public Service Company of Northern Illinois, has some radio telephone tests under way between Blue Island and Joliet, Ill., and is considering installations between sections 150 miles apart. A number of electric companies, such as the Montana Power Company, regularly employed radio telegraphy for regular and emergency use prior to the war with good results. Still another class of applications was found practicable by industrial concerns for intercompany business in the rubber, mining and milling industries, and often such use showed a saving in competition with leased wire service. In railway work possibilities have been demonstrated by the Delaware, Lackawanna and Western Railroad, and the Union Pacific Railroad Company has also encouraged certain work by Dr. F. H. Millener with this end in view.

Thus, while the outlook for land radio is at present checked by restrictions controlled by the Navy Department, it is reasonable to expect that these will be soon removed and that further improvements in equipment will see a considerable advance in applications in railway, electric power, industrial and mining service. The radio telephone offers the most possibilities, as the need for expert code operators is eliminated. Girls have, however, been used with success as code operators for intercompany radio traffic. The combination Edelman method offers many advantages in that the number of code operators is reduced to one. In this plan communication from the central plant is via radio telephone to outlying stations. Communication reversely from the outlying stations is via radio telegraph controlled by automatic typewriter keys, such as any unskilled person may operate. The advantage over straight radio telephony is in lower first cost and greater reliability, pending further development of radio telephone equipment. The use of intricate calling mechanisms is avoided by using a time call system.

The outstanding advantage of radio systems is the fact that lines do not have to be maintained, and are accordingly exempt from line troubles due to storms, etc., such as are the bane of the wire systems. The first companies installing equipment will gain not only the usual benefits of economy and valuable experience not possessed by their competitors, but will, according to experience of others, gain far more than the initial cost in prestige and advertising which necessarily results from such a forward step as the introduction of wireless communication to the progressive business concerned.

Moreover, receiving equipment is surprisingly cheap and serviceable, and inasmuch as one transmitting station can communicate with ten or a thousand receiving stations with equal facility, the use of radio communication appears promising for railway work of a different character than has heretofore been attempted. That is, it appears entirely feasible to have a central dispatching station and equip passenger and freight trains with the inexpensive receiving equipment only, or with receiving equipment and automatic transmitter, as in the Edelman plan. As radio telephony can be used at the transmitter, no code need be learned by the operator on the trains, but orders can be received on a time schedule basis and can be acknowledged either by automatic key telegraph, as in the Edelman plan, or by ordinary land telegraph when the next way station is reached.

The immediate practicability is not urged so much as are the obvious future possibilities, and, as usual, the ones to benefit most will be those companies farsighted enough to prepare and make trials now, while the tail-enders will, as is customary, be glad enough to pay fancy prices for the same services later when they find a belated compulsion to imitate their earlier competitors.

Naturally, extensive applications of radio methods for land work will bring problems such as interference, etc., but these will in time be overcome, just as the early telephone land wire system troubles have largely been overcome.

Altogether, therefore, the outlook is still worthy of serious attention on the part of those who can see further than just one day ahead.

The Earth as a Conductor of Electricity.

The function of the earth when used as part of a telegraph circuit is considerable of a puzzle to scientists and engineers. There are many theories and possibly the right one has been formulated, but as to that nothing is certain as yet.

We all like to know why certain things happen when we do certain things, and no doubt we will know some day why the earth can be used in place of a wire to complete an electrical circuit. We need not bother our brains about this matter, however, so long as we know that the use of the earth saves telegraph and telephone companies many thousands of dollars. The entire cost of the return wire is saved, while at the same time the resistance of the circuit is reduced nearly one-half.

All is not gain, however. A grounded circuit is more difficult to maintain in an efficient condition of insulation than is a metallic circuit, where the earth does not enter into the make-up. A grounded circuit is subject to more or less interference from currents arising from the earth, but in practice this does not work any serious disadvantage. Some systems of telegraphy, however, are supersensitive to earth influences, but means are employed to neutralize these effects. The telephone is particularly sensitive to earth currents, and that is why telephones require metallic circuits.

Second Liberty Loan.

As the time approaches for the second issue of the Liberty Loan it has been suggested that those who intend to invest in it should begin to save their money now. It is a wise form of investment, and many telegraph and telephone people who invested in the first loan are now or will be ready to take part in the second loan when the call comes.

The Life of Joseph E. Hurley, Telegrapher, Humorist and Gentleman Hobo.

BY THOMAS BOYLE.

Born, somehow and somewhere, in Canada, Joe early espoused the cause of Morse, and for many years thereafter was firmly wedded to it. Like all Canadian telegraphers, he "cut in" for New York as soon as he graduated from the "frite gerse" ranks. During his first stay in New York the writer is somewhat vague as to record. His first appearance in the "making of history ranks" occurred when he bobbed up as an operator for the Southern and Atlantic Telegraph Company in the malodorous town of Augusta, Ga., about 1874. He was easily recognized by his white tie and shiny shirt front and clean scraped face, which gave him a clerical appearance. Very little was known of him at this time, for he seemed to be of a meek and retiring nature, while the majority of operators in his neighborhood were seekers after the wild eyed goddess of pleasure, among whom was the would-be biographer. His exodus from Augusta was similar to his arrival at that point—quietly unannounced.

After a whole year had passed, during which time the name of Hurley was almost forgotten, he applied, from New York, for the position of night chief for the Western Union at Augusta, which he readily secured, the position at that time being looked upon as an infringement upon the liberties and pleasures of the force then doing business in that office. Shortly afterward he arrived, white tie and shiny shirt still in evidence. His advent was heartily welcomed because the men (there were no lady operators at Augusta at that time) would be relieved from taking turns closing the office at night. He went to work as if he were a native, and what he did not know about the board and repeaters day chief J. W. Brown willingly taught him. He was the second and last night chief imported from New York, Tom Carter being his predecessor.

Everything moved along as if it had been made to order for him, nothing occurring to disrupt his quiet dignity and serenity. Then his Nemesis began to get busy. He became very comrady with a certain operator in the office. His childlike blandness began to disappear, his face became more florid, and his hands were noticed to tremble at certain times without the aid of a "70-Croscope." He appeared handsomer, more robust and more cheerful. This transformation was not brought about by warring on spiritus frumenti, because Joe looked upon it as one of his friends and associated with it in the most friendly manner. His work was never neglected, though he sometimes became the victim of inertia, and developed a somewhat absent mindedness. He made his debut when the Western Union office was a small affair on the second floor of a small building on the south side of Broad Street. Shortly after it was moved across the street to larger quarters on the ground floor. Of course this demanded larger ideas on all subjects, and Joe and his tutor began the study of them immediately. Everything worked smoothly and no complaints were heard from the inside or outside.

In the meantime Mr. Hurley had become enamored of a lady fair at his boarding place. She was good to gaze upon, provided you were tall, for she must have been a shade over six feet. No one knew this until he inadvertently made it known himself by leaving an unfinished letter on a desk one night during the stress of wire trouble. He had hardly got much further than the top piece—"My Dear Little Darling"—when he must have been called to the board. After that he was spied on and was seen on several occasions walking with a lady about six inches taller than himself. Some cruel minded person finally mailed him the unfinished letter which was found on the desk and the match was disrupted.

Joe was a tireless worker and did his work well. Many a time he subbed for his comrade on the next morning when that atom had been browsing around the night he was off duty. It was noticed that Mr. Hurley had become familiar with such words as "keno," "keeping cases," "single out," "double out," and a lot more of their kind generally used by the sporting gentry. Nothing serious was thought of it, however, because he was a diligent reader of all the latest periodicals and it was surmised he had come into possession of them in that way. 'Twas ever thus from childhood's hour.

Gradually Joe's and his comrade's wearing apparel commenced to lose its shimmer and sheen, and they became rather careless in other matters, but never neglected business. At that time—the Ku Klux age—there was a villainous carpet-bagger over in Carolina by the name of Tim Hurley. If you wished to arouse Joe's ire, all that was necessary was to address him as Tim. The then manager, John Crowley, became aware of this and, to revenge himself on Mr. Hurley, he applied it to him one day, with dire results. Thereby hangs a tale.

Manager Crowley was never noted for his inventive genius, but one morning there appeared in the *Chronicle* an item stating that Manager John Crowley of the Western Union Telegraph Company had invented a cockroach trap which was sure death to that nauseous bug. We all were greatly surprised and demanded that he demonstrate his invention to us. He agreed. Several nights afterward he rigged it up in the washroom. It consisted of several Chinese lanterns with a lighted candle within and the proper holes cut in the lower parts to allow the roaches to enter when they became curious to find out something about China. It happened on that night that Joe and his comrade had gotten off to attend the theatre and several other places of amusement and passed the office in the small hours. Both feeling very dry, and having an eyeopener in their pockets, decided to enter and take a farewell nip out of the office glass. It appears that Mr. Hurley had not read Manager Crowley's puff in the paper. So when he entered the washroom and saw the beautiful lanterns scattered all over the floor he became rather skittish and, before his comrade could explain and prevent him, he had kicked about four of them out of the trap business. When he was informed of their nature he and his partner tried to rectify the damage, but could not do so. They then thought best to remove the wrecked traps and proceeded to do so. They would have escaped guiltless had not the man who was working for Joe seen them come in and mentioned the fact to Crowley. I sympathized with Crowley. It must have been a long and painful effort for him to evolve such a startling innovation into the insect world. Joe and his comrade tried to explain how it was not, but Crowley would not be appeased. Hence the epithet to Joe of "Tim." That settled it. The office air became red and Mr. Hurley resigned on the spot. If he had stopped there all would have been well, but he immediately sought a bottle palace and proceeded to drown his indignation. He became more desperate than any Canadian now in front of Lens. His comrade tried to pacify him and did so to the extent that he promised to go to dinner and take a sleep afterward. Then his comrade journeyed homeward. After dinner he came uptown and found Joe sitting in front of the Western Union office in a very belligerent state of mind. He lugged Joe around on the back street and steered him for his boarding house. Shortly afterward, as he was sitting in front of the office, Crowley appeared and posed in the front door. Suddenly Hurley pranced around the corner of the alley and, spying Crowley, made a rush for him. Crowley was no warrior bold. When he saw Joe flying towards him he turned like the moujik and fled for a door in the office lobby leading into the office. Joe's wrath lent wings to his feet and, overtaking John as he sped through the door, he lifted one of his number eights and vigorously applied it to Crowley's anatomy. This aroused all the latent fire of the old time F. F. V. blood in John and he suddenly turned and put up his potato peelers in a way that would have pleased Kid McCoy and advanced on Joe, who, nothing loth, advanced too to meet the attack. Before blood could be drawn the lineman grabbed Crowley and Joe's comrade got a strangle and crotch hold on him and lugged him off the field of gore. By that time old man Brenner, superintendent, etc., appeared on the scene and bellowed "police!" A green cop ran up and J. A. B. ordered him to remove Mons. Hurley to the cooler. Joe's comrade suggested that he also gather Crowley in too, as he was one of the principals. He did so, when the procession moved onward for the house of detention, where padded cell No. 12 was swept out for Hurley and he entered it without a tremor. This satisfied Crowley and J. A. B. and we all returned to the office. At 12 o'clock Joe's comrade, thinking Joe had had a good rest, went around to the cell and bailed him out and took him to his boarding place. He left town a few days later and nothing further was heard of him until an acquaintance who had been down to the Isthmus of Panama informed the comrade that he had met Joe there and that he had sent his regards.

That was the beginning of the end. The writer never saw him again until about 1886, when he met him in New York, looking none too well. They adjourned to a basement and talked old times. Joe did not seem glad when he was told that his writings for the TELEGRAPH AGE were very highly spoken of. He merely said to the biographer: "If it had not been for you I never would have written anything." That was no lie. He would have married the tall lady and helped her father work the farm on Beach Island and the telegraph world would have been minus many a good laugh. The writer has always blamed himself for Joe's future conduct after they met. Perhaps the Spider of Fate is the one to blame.

I met Joe at long intervals while in New York, but every meeting showed that his case was hopeless. I think he had more originality of wit and humor than Bill Nye, Artemus Ward or Mark Twain. He sought no notoriety and got none. Why I should say all that I have about him I do not know unless to show both sides of his character. One of his brothers held a high position with the Singer Sewing Machine Company in New York. Ed Delaney was in a different class as a writer, although some of his stuff was good, too.

"De mortuis nil nisi bonum."

[Joe Hurley was a regular contributor to the columns of this paper twenty-five years ago, and the original humor of his communications at once placed him in the front of telegraph humorists and writers.—Editor.]

BOOKS

Principles of Electricity.

First Principles of Electricity, by J. E. Homans, is a valuable book for all electrical students.

In this volume, which is in a class by itself, the author undertakes to treat of the principles of the electrical science from the ground up. He reviews all the matters necessary to constitute a fundamental knowledge of all forms of electric current, and is very lucid in his explanations of obscure points. Nothing is omitted and nothing is slighted that is necessary to give the student and reader a thorough grounding in the science.

The illustrations are very clear and easily understandable and altogether this volume certainly will be a great help to those who wish to learn the fundamental facts of electrical action and apparatus. Not only will it be useful to beginners but to advanced students as well, and also to practical electrical workers. The price is $1.00 per copy. For sale by TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

TELEPHONE CONSTRUCTION, INSTALLATION, WIRING, OPERATION AND MAINTENANCE. By W. H. Radcliffe and H. C. Cushing, Jr. A guide for the installation of telephone exchanges in buildings and small towns. An extremely practical book. 165 pages and 120 illustrations. Price $1.00.

For sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

TELEGRAPH AND TELEPHONE AGE is always worth reading.

Efficiency Engineering in the Telegraph Service.

(Continued from page 378, August 16.)

In the previous instalment on "Efficiency" we had something to say in regard to members of the profession who were not prompt in the payment of bills. We also devoted a little space to the common practice in many offices of borrowing money. The article has occasioned much favorable comment. One writer states that it should be placed on every bulletin board in every telegraph and railroad office in the country. It would have a salutary effect.

Men are beginning to realize that employing interests have a way of finding out whether those who are seeking advancement are prompt in paying their bills or whether they belong to that class of borrowers which unfortunately are found in all large commercial centers. In both instances it is a case of living beyond one's means. In the first instance bills covering the necessities of life are held up while in the second case the borrower endeavors to secure sufficient cash from others to carry him along until payday. Those of our readers who have not read the article should do so at once and thus be prepared to deal with this class of people as they should be dealt with. There is absolutely no excuse, barring sickness, for a man to live beyond his income no matter what his rate of pay may be. In so doing he is not dealing fair with himself, his associates or his employers.

Every man wishes to improve his condition. This is natural and the question brings us to the larger problem of fitting one's self for promotion.

We are occasionally asked by wide-awake young managers of telegraph offices who wish to "make good," and by hope-to-be managers, as to what qualifications are considered necessary to make a successful manager. We like to have such questions asked because underneath the surface there is as much deeper meaning than appears on the face of the question itself, and a man who seeks such information is of value to any telegraph company. It would be well if more managers, or prospective managers, would give this subject their earnest attention and endeavor to make their services more valuable to their company.

A successful manager in any town or city can become a leader in the community in which he resides if his efforts are well directed. Not all can, or know how, to direct their efforts to the best advantage, without study, but there are a few principles that must be adhered to closely to achieve success as a manager, and by practicing them results cannot fail to come in full time.

Without diligence, or a steady application to whatever is undertaken, it is vain to hope for any decided success. Mere fitful activity accomplishes little, but to well-directed and persevering industry nothing is denied. Industry must be accompanied by energy to become effective.

"Push" is a synonym of industry. It is not enough to work just to keep things going. It is necessary to anticipate and look about to see what more can be done to improve existing conditions.

Diligence, enforced by energy should be guided by good judgment. Misdirected labor is little better than idleness; everything a man does must be made to count. In order to use good judgment a man must be prudent, which implies the discreet suiting and disposing of both words and actions in their due time, place and manner.

Knowledge of business methods is necessary to be a successful manager, and this is very important. The manager has the service of his company to sell to the public, and this cannot be done successfully unless he understands the principles of conducting business.

One of the most important qualifications in a manager is a good address. This can be cultivated and in practice it pays the possessor high interest.

Politeness is a primary law in business, and it is useless to try to do business with the public without it. A lack of politeness makes enemies and that is what the companies desire to avoid. By practicing politeness the individual himself derives much benefit, as well as does the company he represents.

A man must be self-reliant and think and act for himself. One who is not self-reliant is likely to remain in subordinate positions all his life. All great and successful men have been self-reliant, and have led in thought and action rather than followed others. Remember that "God helps those who help themselves."

It is hardly necessary to remind one that honesty is one of the leading qualities of character. Without it no manager can succeed in or out of the office, and if a manager's honesty is compromised in any way the knowledge of it works serious harm to the company's interests. Therefore, be on guard at all times to preserve your reputation for uprightness of character. Make friends with the business men of your town. This counts for a great deal. Make patrons feel that you are their friend; be polite and recommend your company's service. Make use of every means to meet business men, and you will get business. Join clubs, etc., in order to attain your end.

The foregoing are merely suggestions as to how a man can make himself a successful manager, and any one following this advice cannot fail to win the prize of success and satisfaction.

(To be continued.)

Telegrams to Sailors.

Telegrams to men on board of United States warships must be addressed to them through the Bureau of Navigation at Washington, in order to conceal the location of the ships from agents of the enemy. Messages of the class known as "life and death" will be rewired to the men aboard ship, but less urgent messages will be relayed by mail from Washington.

Don't be a "slacker." Subscribe for TELEGRAPH AND TELEPHONE AGE.

Origin of the Western Union Telegraph Company.

(Continued from page 372, August 16.)

Correction: (For George W. Burbank, in the list of Directors, read Gideon W. Burbank.)

We, the undersigned, do hereby severally agree to take and pay for the number of shares in the capital stock of "The New York and Mississippi Valley Printing Telegraph Company," set opposite to our names respectively, upon the terms and conditions in the preceding Articles of Association, specified and set forth April 1, 1851:

Subscriber's Name.	Residence.	No. of Shares.

THE NEW YORK AND MISSISSIPPI VALLEY PRINTING TELEGRAPH COMPANY.

We, whose names and seals are hereunto affixed, do certify as follows:

First: That we have formed a Company for telegraphic purposes, with a view to an incorporation under the Act of the Legislature of the State of New York, entitled "An Act to provide for the Incorporation of Telegraph Companies," passed April 12, 1848.

Second: That the name by which the said Company is to be distinguished, and which is to be used in carrying on its operations is "The New York and Mississippi Valley Printing Telegraph Company."

Third: That the object of said Company is to construct and use a line of telegraph communication from the City of Buffalo, along the south side of Lake Erie, to the State of Pennsylvania, with the right, subject to the laws of the several States which it may intersect, to construct, own and operate a line of telegraph extending from the Western terminus of the line above described, through the intermediate States, to the City of St. Louis, in the State of Missouri, touching at Cleveland, Columbus, Cincinnati and such other points as may be deemed advisable.

Fourth: That the capital stock of said Company is three hundred and sixty thousand dollars, to be divided into thirty-six hundred shares of one hundred dollars each, with power to increase the same in the manner prescribed in the articles of association and incorporation hereto attached.

Fifth: That the names and places of residence of the shareholders, and the number of shares held by each respectively, are as follows:

Samuel L. Selden, of Rochester, New York, nine hundred shares.

Freeman M. Edson, of Rochester, New York, nine hundred shares.

Isaac Butts, of Rochester, New York, nine hundred shares.

Sanford J. Smith, of St. Louis, Missouri, nine hundred shares.

Making the aggregate of thirty-six hundred shares.

Sixth: That the Company shall commence on the first day of April, eighteen hundred and fifty-one, and shall terminate on the first day of April, nineteen hundred and fifty-one.

Seventh: That the affairs of the Company are to be managed under and according to the annexed Articles of Association.

In Witness Whereof we have hereunto set our hands and seals on the day of the year first above written.

Sam'l L. Selden, [L. S.]
F. M. Edson, [L. S.]
Isaac Butts, [L. S.]
Sanford J. Smith, [L. S.]

State of New York, } *ss.:*
Monroe County, }

On this second day of April, 1851, before me, the subscriber, came Samuel L. Selden, Freeman M. Edson, Isaac Butts and Sanford J. Smith, to me known to be the persons described in and who executed the foregoing certificate, and severally acknowledged that they executed the same.

A. E. Pardee, *Comr. of Deeds.*

Certificate of a Resolution adopted under and by virtue of an Act of the Legislature of the State of New York, entitled, *"An Act to amend an Act entitled 'An Act to provide for the Incorporation and Regulation of Telegraph Companies,'"*—being chapter 471, of the laws of 1853, by a majority of the Board of Directors of The New York and Mississippi Valley Printing Telegraph Company, or association owning and using a telegraph line partly within this State.

At a meeting of the Board of Directors of the New York and Mississippi Valley Printing Telegraph Company, duly convened, held at the office of the Secretary of said Company, in the City of Rochester, in the State of New York, on the twentieth day of January, 1854:

Resolved by this Board, that The New York and Mississippi Valley Printing Telegraph Company, now owning and using, and having owned and used on the 29th day of June, 1853, and long prior thereto, and ever since, a line of wires of telegraph, or a telegraph line, partly within the State of New York, and partly within the States of Pennsylvania, Ohio and Kentucky, that is to say, from a point in the City of Buffalo, in the State of New York, to the City of Louisville, in the State of Kentucky, passing through Dunkirk, in the State of New York, through Erie, in the State of Pennsylvania, through Cleveland, Columbus, Dayton and Cincinnati, in the State of Ohio, through Covington, Georgetown and Frankfort, in the State of Kentucky, to the City of Louisville aforesaid (and to include a branch circuit to Lexington, in said State of Kentucky, to be completed), shall organize under the Act of the Legislature of the State of New York, passed June 29, 1853, entitled *"An Act to amend an Act entitled 'An Act to provide for the Incorporation and Regulation of Telegraph Companies,'" Passed April* 12, 1848, in order that the said Company may become a body corporate, and be entitled to the benefit of the provisions in the said amendatory Act contained, on filing in the office of the Secretary of State a certificate of a resolution adopted by a majority of this Board of Directors to organize under the said last mentioned Act.

And thereupon, be it further

RESOLVED, as follows:

First. That the name assumed to distinguish the said Company and to be used in its dealings, and by which it may sue and be sued, is to be and is—"THE NEW YORK AND MISSISSIPPI VALLEY PRINTING TELEGRAPH COMPANY."

Second. That the general route of the said line of telegraph is from a point in the City of Buffalo, in the State of New York, to the City of Louisville, in the State of Kentucky, passing through Dunkirk, in the State of New York, through Erie, in the State of Pennsylvania, through Cleveland, Columbus, Dayton and Cincinnati, in the State of Ohio, and through Covington, Georgetown and Frankfort in the State of Kentucky, to the City of Louisville aforesaid (including a branch circuit to Lexington, in the last mentioned State), to which several places above mentioned are indicated as the points to be connected thereby.

Third. That the capital stock of said Company is to be and is one hundred and seventy thousand dollars, divided into seventeen hundred shares, of one hundred dollars each share.

Fourth. That the following list exhibits the names and residence of the shareholders of the capital stock aforesaid, and the number of shares held by each of them respectively.

Names of Shareholders.	Residences.	No. of Shares.
J. L. Allen	New Haven, Conn.	11
A. Arnold		4
William Alling	Rochester, N. Y.	30
Bacon & Co.	Do.	47
Isaac Butts	Do.	55
Wm. Buffam	Stratford, Conn.	11
G. W. Burbank	Rochester, N. Y.	15
C. G. Brinsmade	Do.	1
Jas. Chappel	Do.	10
Freeman Clarke	Do.	75
Dows & Carey	New York City	20
F. M. Edson	Flushing, N. Y.	30
J. R. Elwood	Rochester, N. Y.	250
A. Gardiner	Do.	75
F. G. Jewett	Skaneateles, N. Y.	75
Cam. Livingston	New York City	41
G. H. Mumford	Rochester, N. Y.	75
J. Medbery	Do.	75
J. F. Morris	New York City	74
H. S. Potter	Rochester, N. Y.	125
W. H. Perkins	Do.	4
J. B. Richards	New York City	40
R. W. Russell	Do.	36
E. F. Smith	Rochester, N. Y.	4
A. Sampson	Do.	30
H. Sibley	Do.	114
S. L. Selden	Rochester, N. Y.	55
J. B. Stillson	Do.	30
E. P. Willis	Do.	30
		1,442

(To be continued)

A Mistake in the Tolls.

BY E. H. HOGSHEAD, NEW ORLEANS, LA.

In the year 1867 Maximilian, Emperor of Mexico, was defeated in battle by General Juarez, of the Mexican revolutionary army, captured, tried, convicted and executed, his wife, the ill-starred Empress Carlotta, being then in Europe. The body of the Emperor, together with the members of his court, and all their belongings, were placed aboard an Austrian warship headed for France. Nothing was known in the United States of these tragic happenings—there being no railroads or telegraphs connecting this country with Mexico—until the arrival at the mouths of the Mississippi River of the Austrian man-of-war. The officers of the Maximilian government reported from there by wire to the French consul at New Orleans, who promptly cabled the news to Emperor Louis Napoleon's government at Paris by a long code message, consisting entirely of groups of figures. The first successful Atlantic cable was then but about a year old, and the tolls were very high, the rate from New Orleans to Paris being ten dollars per word.

A young man named Moloney received the message at the office counter of the Western Union Telegraph Company, collecting therefor, at regular rates, six thousand five hundred dollars. The cablegram, after being sent, was turned over to the cable clerk, Robert Parsons, who instantly saw that it was a code message and code messages were charged double rate. He promptly reported the error to the manager, Mr. G. L. C. Davis, who, like Belshazzar, when he saw the hand writing on the wall, "was seized with consternation." Parsons suggested that they go and see the French consul and explain the case to him. They did so and were courteously received by that official. When they were seated the consul called to his valet to bring him his hat. Mr. Davis, in his perturbation, had seated himself with his hat on. Parsons saw the point and suggested to Davis that he remove his hat, which he did. Davis then explained the situation to the Frenchman, who, with dignified condescension, informed him that the French Government was amply able to discharge its financial obligations and requested that a proper bill for the cable tolls be made out and presented. A bill for thirteen thousand dollars was then submitted and a check to cover the same was handed Mr. Davis, who heaved a deep sigh of relief, and doubtless then solemnly vowed to himself, "Never again."

This cipher cablegram was transmitted to New York direct on two circuits, O. C. Hatton and Patsey Ayres handling one-half each.

[Mr. O. C. Hatton, one of the operators mentioned, is a well known old time New York telegrapher. The Western Union Telegraph Company retired him on pension three years ago but owing to the scarcity of operators he is again to be found at the key in the New York main office. Mr. Albert S. Ayres, better known as Patsey Ayres among members of the profession, was one of the gilt-edge operators of his day. He died in Cincinnati ten years ago.—Editor.]

FOR CLEAR TRANSMISSION

EDISON PRIMARY BATTERY DIVISION
THOMAS A. EDISON, Inc.
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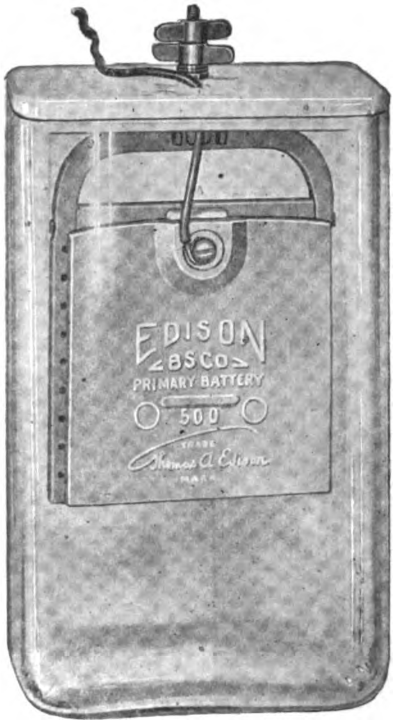

HALL SWITCH AND SIGNAL CO.

New York **Chicago**

MANUFACTURERS OF THE

GILL SELECTOR

THE UNIVERSAL SELECTOR FOR TELEGRAPH AND TELEPHONE

Out of the experienced past, into the exacting present, KERITE through more than a half-century of successful service, continues as the standard by which engineering judgment measures insulating value

DAYS KERITE

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO

THE RAILROAD.

Edward Dickinson, one of the receivers of the Kansas City, Mexico and Orient Railway Company, and formerly general manager of the Union Pacific Railroad, died at his summer home in Minnesota, August 14. He was an old-time telegrapher and well known to the older members of the profession. He was regarded as one of the leading railroad officials in the United States.

Wireless Telephone and Railroads.

At the annual meeting of the Association of Railway Telegraph Superintendents held at St. Paul, Minn., in June, 1916, Mr. Chas. H. Wilson, general manager, Long Distance Lines, American Telephone and Telegraph Company, New York, made some interesting remarks regarding the developments of wireless telephony and its relations to railroading. He stated that the members of the Association were particularly interested in the wireless telephone and that they were looking forward to the time when they might communicate by this method with trains. He thought that the time when this could be done was not very far off. The time has not arrived yet, however, when the necessary appliances could be carried on trains for that purpose, but his company was making great progress in this direction.

He told of the completion of a line of creosoted poles from Jacksonville to Key West, Fla., over the Florida East Coast Railway, there to connect by wireless with all the islands in the Gulf of Mexico. He regarded creosoted poles as the best kind of pole line that the telephone company knew how to build.

Electrolysis.

The National Bureau of Standards has given considerable study to the subject of electrolysis and has made a large number of experiments with a view to its mitigation.

At the St. Paul convention of the Association of Railway Telegraph Superintendents in June, 1916, a report was made of Special Committee No. 4, Protection Against Electrolysis, in which the work of the Bureau was referred to at length.

"In considering the subject of regulations for the mitigation of electrolysis," the Bureau says, "it should be borne in mind that while the railway companies are chiefly responsible for reducing stray currents to as low values as are commercially practicable, the owners of underground utilities also must be considered to have certain responsibilities, particularly in so far as new construction work is concerned in territory already occupied by electric railways.

"There are a number of things that pipe and cable owning companies can do at a very slight additional expense which will go very far to reduce electrolysis trouble, provided such measures are taken at the time the pipes or cables are installed. For example, in new work or repairs, pipe lines should be laid as far as possible from railway tracks. Where the density of service connections is sufficient to justify the use of two mains, one on each side of the street, these should be laid down in order to eliminate the necessity for running services across under the railway tracks. This is quite common practice in many places where the utilities are highly developed, and it could frequently be extended in many instances with considerable improvement in local electrolysis conditions. Further, in laying new mains or repairing old ones, it is very simple and inexpensive to install a sufficient number of insulating joints largely to reduce stray currents in that portion of the pipe network, and such construction should be encouraged in every practicable way."

Mr. F. E. Bentley, superintendent telegraph, Terminal Railroad Association of St. Louis, St. Louis, Mo., writes: "Thank you for renewing my subscription. St. Louis Union Station is enlightened immeasurably on each receipt of the Age."

Improved Telegraph Key.

Mr. C. M. Holmes, a well-known telegrapher of Jacksonville, Fla., has invented and obtained a patent on an improved form of telegraph key which has for its purpose the making of a firm contact in cutting a hand transmitting machine into circuit. According to present practice a wedge is used to connect the transmitter to the key. There are some objections to this wedge, which Mr. Holmes seeks to overcome in his invention. He provides a socket in the base of the key, into which a plug connected to the "bug" is inserted, thus giving a firm contact and avoiding damage to the key, which frequently results when the wedge is not properly handled.

As is well known, delays to business frequently occur by reason of the imperfect contacts when using the wedge, and in large offices where many sending machines are used the aggregate of such delays amounts to a very large figure in lost time. Mr. Holmes' device saves all this time, because the insertion of a plug is instantaneous and positive, and the contact is just as firm as one at the switchboard, especially in circuits in the woods. Often there are circuits that will not carry a bug and the operator may lose perhaps five or ten minutes in an effort to use one. He finally gives up and sends the business by hand. Lines or circuits not equipped with this key would designate the business to be transmitted by hand sending and thus valuable time is saved.

This invention is a distinct improvement and will no doubt find a very general use.

"REMCO"
ALTERNATING CURRENT SELECTORS
(Controlling Patents)
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Magnetic Lines of Force.

One of the difficult things for the novice to grasp in the study of electricity and magnetism is the idea of lines of magnetic force. The term is a hypothetical one and may or may not express the action that really takes place. Still this is like many other electrical and magnetic terms. We assume them to be true because the resulting phenomena are what would occur if our assumptions were true.

We have not yet discovered what electricity is, and until we know what it is we cannot hope to explain the existence of magnetism and magnetic lines of force.

Between the two poles of a permanent magnet, or of an electromagnet, a certain action takes place, which cannot be seen or felt, but can be detected by the use of a magnetic needle. It is this action, or strain, in the surrounding air, or ether, that is known as the magnetic field, or lines of force. A magnetic field is a portion of the area traversed by the lines of force, and is a very important fact in relation to electrical apparatus.

Lines of force, in the absence of better knowledge, is a force that passes from the north pole of an electromagnet to the south pole, through the air in curved lines. They tend to take the shortest distance in passing from one pole to another, but on account of their number they crowd one another so that they take the curved form between poles.

A magnetic needle used in a certain way enables us to see the effects of these lines of force, and from the knowledge thus gained scientists have been able to produce some wonderful devices based upon electromagnetism. Telegraphy, telephony, wireless telegraphy, the electric generator and the electric motor all depend upon electromagnetism for their action. If electromagnetism should universally fail to act one can faintly realize what a catastrophe would follow. All of these utilities would be deprived of their life, and the world would be suddenly set back to where it was before electricity was discovered.

Exchange of Free Service Illegal.

Judge Evan A. Evans, acting in the Eastern Division of the Northern District Federal Court of Illinois has rendered an opinion upholding the ruling of the Interstate Commerce Commission that the exchange of free services between telegraph companies and railroad companies is illegal.

Handbook for Telegraph, Telephone and Electrical Engineers

"The Electrical Engineer's Handbook" is a very valuable work for telegraph and telephone engineers to have handy for reference. It is a standard work and universally recognized as accurate and authoritative and is a great help to practicing electrical engineers. It has 414 pages, many illustrations, and measures 3¾ x 5 inches. The book is a veritable mine of information and contains tables which are of great value.

Following are a few of the subjects treated: The metric system; chemistry and electrochemistry; magnetic quantities; laws of the magnetic circuit; condensers; size of wire for telegraph and telephone lines; direct current generators and motors.

There is a great satisfaction in the possession of a copy of this book because it contains so much valuable information for the practicing engineer and the student, and the matter is so well gotten up and the illustrations are so clear and correct that one can rest assured that he has the best information obtainable. This is one of the books published by the International Textbook Company. The price is 50 cents per copy. Copies are for sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

INDUSTRIAL.

The J-C Repeater.

The Jester-Cooper Company, Houston, Tex., reports that the demand for its repeater is constantly increasing, and that it is rapidly making a permanent place for itself in the telegraph business. It is a direct point repeater and obviates the need for a local battery. It is simple in construction and easy to adjust, and its working efficiency is at the highest attainable point.

This repeater is in use by the United States War Department and by many of the principal railroads. A card will bring a descriptive circular.

The Morse-Phillips High-Speed Telegraph.

Inquiries have reached us regarding the Morse-Phillips high-speed telegraph referred to in the advertisement of the Phillips Manufacturing & Trading Company of Bridgeport, Conn. For the purpose of enlightenment we give a brief description of the system.

The messages to be sent over the wire are first recorded in raised telegraphic characters on a strip of paper. This strip is then run through a transmitting machine at an accelerated rate of speed. At the distant end of the wire the received matter again comes out in the form of Morse characters raised on a strip of paper. This strip is then reproduced on local sounders at varying rates of speed. The transcribing operator can vary the speed of the tape and consequently the characters pass through the machine to suit himself. He can stop it at any point, and can pull the tape back if he wants it repeated. The matter recorded on the tape can be transmitted at once or at any time later. The reception can be accomplished directly from the receiving sounder or the incoming messages can again be taken on a recorder and reproduced at any speed later. In case an operator has any other duties to perform all he has to do is to switch on the recorder and let it take care of itself while he is attending to other work.

It is evident that this system lends itself very readily to the teaching of telegraphy. The tape records can be easily made by an expert, and in running them through the transmitter the speed can be adjusted to suit the ability of the student to receive.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

JOINT RESISTANCE OF CIRCUITS.—(*Continued*)

Now, since the joint resistance of the wires is the sum of their respective conductances, their joint conductance would be $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6} = .5$ That is, .5 mho would be their joint conductance and since, again, conductance is the reciprocal, or converse of resistance, the resistance of a conductor having a conductance of .5 mho, would be $\frac{1}{.5}$ ohm; that is, two ohms. In other words, the joint resistance of the said three wires in multiple would be two ohms.

The foregoing would be stated, according to the rule for finding joint resistance, as follows:

$$\frac{1}{\frac{1}{6} + \frac{1}{6} + \frac{1}{6}} = 2 \text{ ohms.}$$

JOINT RESISTANCE AND CONDUCTANCE.

Having the foregoing in mind, the explanation of the law of joint resistance of conductors in "multiple" (or "parallel") will become plain. It virtually resolves itself into this: First, find the sum of the conductances of conductors whose resistances are known, and then ascertain the reciprocal of the sum of those conductances, which will be the joint resistance of the conductors.

The formula for finding the joint resistance of two circuits, R and r in multiple is generally stated thus:

$$\frac{R \times r}{R + r} = \text{joint resistance,}$$

or, for example, assuming R to have a resistance of 20 ohms; r a resistance of 10 ohms,

$$\frac{20 \times 10}{20 + 10} = X = \text{joint resistance.}$$

This formula is simply the result of working out the foregoing rule. For example, as before, the conductance of R will be $\frac{1}{20}$ mho; that of r, $\frac{1}{20}$ mho, consequently, their joint conductance will be $\frac{1}{20} + \frac{1}{10}$ or $\frac{1}{R} + \frac{1}{r}$ which, by addition of fractions, is found to be equal to $\frac{20 + 10}{20 \times 10}$ or $\frac{R + r}{R \times r} =$ joint conductance. Then, as joint conductance is the converse of joint resistance, the latter, for two circuits, will be represented by the formula just stated: $\frac{R \times r}{R + r}$; that is, the joint resistance of two circuits is equal to the product of their respective resistances divided by their sum.

The joint resistance of several circuits may also be ascertained by aid of the latter formula, by first calculating the joint resistance of two of the circuits and then using that result as if it were the resistance of one wire wherewith to find the joint resistance of three wires, and the joint resistance of three wires may then be utilized to find the joint resistance of four wires, and so on.

(*To be continued*)

Telephony.

THE FUNCTIONS OF CONDENSERS IN TELEPHONE CIRCUITS (*Continued*).

In the common battery system a condenser is connected in series with the telephone operator's receiver, serving a twofold purpose. In the first place the condenser prevents direct current from flowing through the receiver. When the operator intends to talk or listen to a subscriber she throws a switch, called the "listening key," which connects her receiver and this condenser across the line. As there is a direct current pressure on the line at all times a direct current would flow through the receiver on the operation of this key if it were not for the condenser. This might cause injury to the receiver in two ways; it might strengthen the magnet sufficiently to pull the diaphragm over against the pole faces and prevent its vibration, or it might weaken the magnet and reduce the tendency of the diaphragm to vibrate. In the second place, by limiting the quantity or duration of the direct current which would flow on the operation of the listening key, the condenser reduces a very annoying click which is heard in the receiver when the key is thrown.

A very interesting function is performed by the condenser used in series with the primary of the operator's induction coil in the common battery system. In this circuit the battery current for the operator's transmitter goes from the battery through a retardation coil, the transmitter and the primary of the induction coil back to the battery (see Fig. 1). The function of the retardation coil is to prevent talking current from going through the battery, as in that case the conversation would be overheard on all lines using the battery, or on all lines centering in the exchange. A condenser is connected across the primary of the induction coil

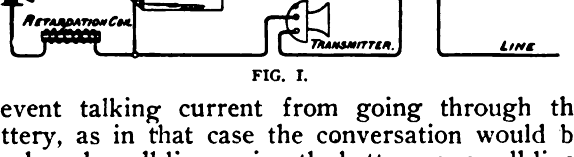

FIG. 1.

forming an easy path for the high frequency talking current without causing a loss of direct current.

The talking current produced in the operator's transmitter flows in a closed circuit including the transmitter, the primary of the induction coil and the condenser. The energy which supplies this talking current comes from the condenser, which charges and discharges very rapidly, taking up or supplying the changes in current caused by an increase or decrease in the resistance of the transmitter. In this way the condenser enables the operator to talk to a subscriber without the talking current produced by her transmitter traversing the battery and being overheard by some other person using the battery at the same time.

(To be continued)

Radio Telegraphy.

CLOSED OSCILLATING OR PRIMARY CIRCUIT.

The actions taking place in the closed circuit as a whole are as follows: The condenser begins to get its charge at the beginning of each alternation, as at points *A, C. E,* etc., of Fig. 1 (August 1 issue), and reaches such a potential as to cause its discharge across the gap and through the inductance at the peaks of the curve, as at points *B, D,* etc. The condenser is, so to speak, a reservoir which is filled and discharged 1,000 times per second in a 500-cycle alternator set. In the accompanying Fig. 1 the upper curve represents the 500-cycle alternating current delivered by the transformer secondary to the condenser, which is charged thereby; the lower curve represents the discharge of the condenser, producing damped wave trains of perhaps twenty or thirty oscillations, each train lasting a few millionths or hundred-thousandths of a second, as shown in Figs. 2 and 3 (April 16 issue). In order to be able to show the wave trains at all in the accompanying figure their duration must be shown much exaggerated as compared with the intervals between them. Thus, if the period of each complete oscillation in the train were $\frac{1}{500,000}$ second and there were twenty-five oscillations in the train, each train would persist for $\frac{25}{500,000}$ second, or $\frac{1}{20,000}$ second, or the duration of each wave train is only one-twentieth of that between successive trains.

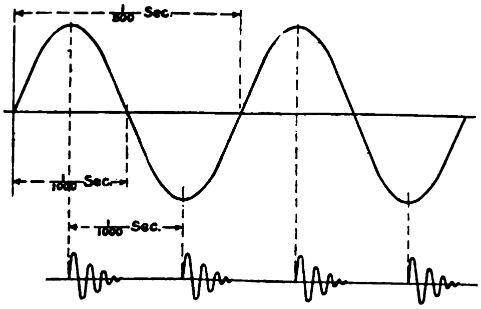

FIG. 1.

It must be noted that although the transformer secondary is connected to the closed oscillating circuit, as shown in Fig. 3 (June 1 issue), it takes no part in the oscillations of this circuit. The reason for this is that the period of the circuit of transformer secondary and closed circuit capacity is so long (in fractions of a second) on account of the large secondary inductance that the wave train in the closed oscillating circuit has been completed before the transformer secondary circuit has had time to complete a part of one of its own slow oscillations. The period or frequency of the oscillations of the closed circuit is thus independent of the transformer circuit.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

Why will a voltmeter or ammeter not record the peak or amplitude value of a varying voltage or current?

What part of the peak value of a sine curve will they record?

What instrument is used to indicate the frequency of an alternating current, and what are the essential features of construction of the instrument?

Shop Talk.

BY THE OBSERVER.

It sometimes happens that certain relays, pole-changers, etc., require a different adjustment than does a similar pattern on the same table. Hence you may often be compelled to vary adjustments. Of course, the instructions contained in certain specifications state the best adjustments from a theoretical standpoint and as such should be followed, but if the eye, ear, etc., suggests a slight variation, make the necessary change and do not think a slight variation will destroy the circuit's capacity. It will most surely help. Such conditions alluded to are the position of magnets; the width of points, etc. It has been stated by many that points on a direct-point relay that have been set very close for automatic work will often prove very poor transmitters when being operated manually. Therefore, if your points are very close, and there is too much complaint, try them slightly wider. After you experiment a few times on such cases you will be able to apply the remedy most efficiently. Never grow listless or discouraged. If some days everything seems to go wrong, keep after things and try to forget the unpleasant, or unsuccessful ones. If we never had any sorrow, it is said our lives would have too much sameness, thereby losing variety. To try and keep busy is a good cure for the blues.

In going over your sets, if there are found any loose screws, nuts, bolts, etc., stop and fix them at once if it is practicable. If you have more urgent work, do it, but do not say: "I'll fix that tomorrow," for tomorrow may be yesterday, or last week, when next you see it, if the thing has not fallen to pieces before then. Keep the repeater tables clean and put in as much time as you can to polish things. If "a stitch in time saves nine," certain it is that "Omy," will make them shine. Don't forget that a visit to the floor jumpers will often show you sounders improperly adjusted; holes worn in directly under the lower stop bolt; screws loose under the base, etc.

Portable Signal Outfit.

It is well known, says the *General Electric Review*, that even an ordinary oil lantern can be seen many miles on a clear night. If the effective size and intensity of such a light is greatly increased its visibility will be correspondingly increased. Tests were conducted some time ago in which, by the use of a 12-candle-power Mazda lamp operated by four ordinary dry cells and backed by a 10-inch Mangin mirror, signals were transmitted a distance of fifty miles and read without the use of glasses. As a result of these tests, a portable signal projector has been developed, consisting of a 6-volt, 1½-ampere, 12 candle-power Edison Mazda C lamp, an 11-inch glass parabolic mirror and a container for the two, equipped with a telegraph key for making and breaking the circuit. Another form of this projector has the battery and key in a separate casing.

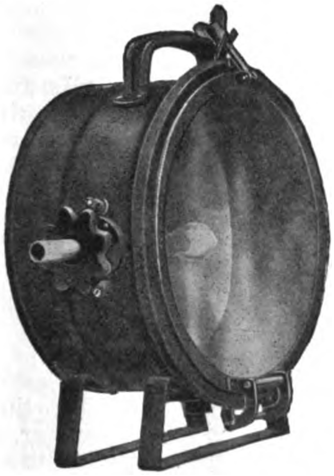

FIG. 1—PORTABLE SIGNAL OUTFIT.

This device has been adopted by the United States Coast Guard service. All their ships and stations are being equipped with them. The outfits weigh but a few pounds and can be set up and operated in the station, or a patrolman can take them out on the beach with him to signal ships or other stations miles away.

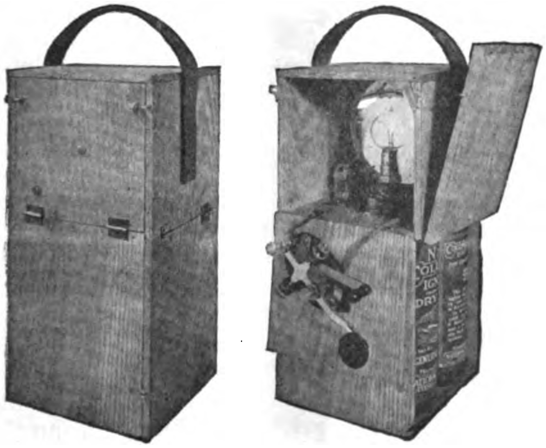

FIG. 2—PORTABLE SIGNAL OUTFIT WITH TELEGRAPH KEY.

These signals also have the advantage of being secret, as only those directly in the path of the beam can read their flashes at any appreciable distance.

A very simple signal projector having a range of some twenty-five miles could be easily made. It consists of a wooden box twelve inches long and five inches square. This box contains a five-inch Mangin mirror. At the focal point of this mirror is mounted a 6-volt, 1½-ampere Mazda C lamp having a maximum concentration filament. In the lower compartment of the box are four standard dry batteries connected in series and to the lamp through a standard telegraph key. Fig. 2 shows such a device.

New Book on Experiments.

Who is there who does not delight in making experiments along some lines? Experiments in chemistry, mechanics and electricity have a fascination for most all young men, and their interest in this use of their time becomes more intense when they are directed in their work by a competent teacher.

Such a teacher is found in a book just published by Mr. Philip E. Edelman, of St. Paul, Minn., well known as a wireless expert and author of books pertaining to wireless work. The title of the book is "Experiments," and the work will be much appreciated by the young minds who have a desire to learn by doing things.

The book is dedicated to all who are interested in progress and includes selected, grouped and graded experiments in science, physics, chemistry, electricity, wireless communication and commercial experiments. It gives practical instructions and working directions and is completely illustrated with tables, etc.

The volume contains thirty-four chapters and the subjects of a few of these are enumerated below to give an idea of the character of the work: Simple experiments in chemistry; electroplating; electrochemistry; small electric motors; electric heating experiments; electromagnetic experiments; wireless telegraphy, wireless telephony and control apparatus; experimental aeronautics; science and invention; essential processes in an experiment; how to conduct original research; testing; etc., etc. It will be seen from this partial list that the book is of an original plan and has brought together in one volume a great many facts in experimental work that are scattered through many books and other works of reference.

Mr. Edelman has given in this book information that will meet with high appreciation by ambitious young men who are eager to understand and solve problems encountered in the various lines mentioned.

The price of the book is $1.50 per copy, and copies may be purchased of Telegraph and Telephone Age, J. B. Taltavall, Publisher, 253 Broadway, New York.

Another New Use for Messengers.—District messenger boys are now frequently called to weed gardens and become embryo farmers. The telegraph companies are endeavoring to make operators of the messengers; now the public is stepping in and trying to make farmers of them.

MR. JEFF W. HAYES' DEPARTMENT.

Mr. Hayes Convalescing.

Jeff W. Hayes, who has charge of this department, is at present in the hospital in Portland, Ore., where he has undergone an operation for rupture. We have interesting data from Mr. Hayes' pen prepared in advance, so our readers will not lose any portion of his stories on account of the unfortunate event.

While convalescing Mr. Hayes is having his new book, "The Pleiades Club," published, and it will be ready for distribution by September 1. The new book is unique in style and romantic and imaginary in its spirit, but containing a wondrous lesson to all its readers. Copies of the book can be had at 50 cents each by addressing J. W. Hayes, 5355 Glenwood Avenue, Chicago.

The Pleiades Club.

CHAPTER XX.

The Thunderbolt Express, on its voyage through space, between the earth and the planet Mars, was signaled from several way stations en route and the following gentlemen took first-class passage to Mars: Charles Deforest, Henry F. Carroll, Billy Birkett, H. L. Childress, Miss Dode Aspwell, Charles F. Holderman, John Egan, of Sacramento, Carrie Cox, of Salt Lake, O. F. Stowe, of Cleveland, and Edward White, of Portland, Ore. These gentlemen had learned of Commodore Haines' expedition but they had been "too busy" to take advantage of the Commodores' invitation to take passage on his car. The members of this little party had many joyous anecdotes to relate of their varied experiences "out in the skies," between the earth and Mars. A reception was accorded them upon their arrival on Mars, and all had an opportunity of visiting their old friends and colleagues. A tri-weekly express train had been established between Mars and Jupiter, and a hegira to the latter planet was quite large, showing conclusively that it only requires a "way short" to set the pace for Mars' former star boarders. Some of the people who left with the Electric Express on August 12 were Jay Gould, D. Doran, James Fisk, Russell Sage, J. Pierpont Morgan and several other former notables and millionaires of New York. A few of these gentlemen wished to have their lives insured against any overt act by pirates who might undertake to intercept them en route, but Henry Ward Beecher and Dewitt Talmage, who were also of the party, laughed them to scorn, asking them what they were afraid to lose. "You have no bodies, you have no gold or silver, you should have no earthly desires, you know your immortal spirit is safe in God's omnipresence, then get on and forget all of your apprehensions."

This little speech had a wonderful effect and the party glided out to their mystic home on Jupiter amid the acclamations of those left behind. The Electric Express was as speedy almost as thought, and seven hours later the train rolled into the newly improvised union depot on the planet Jupiter, where they were greeted by their great, great grand parents, Adam and Eve, who welcomed them to their new home. All of the former Mars contingent were present to assist in the festivities about to ensue, which went to show that there is never anything lost in God's economic universe.

Jupiter's four moons were a subject of much interest to the newcomers, Jay Gould remarking that it would be out of the question to think of effecting a corner on electric illuminating, and Russell Sage nodded his sage head at Gould's wise remark.

Telegraphic communications were sent to the planet Mars announcing the safe arrival of the Gould party. "That is not the first time that Jay Gould and Jim Fisk rode on a train without paying their fare, and I don't believe that the conductor will be fired for carrying a deadhead," said Jules Guthridge. "And now we will not be compelled to ride the breakbeam, either," remarked several members of the I. W. W.

Solomon, who was present in all his glory, was now invited by the members of the United States Military Telegraph Corps to deliver an address which would be transmitted telegraphically to the slackers of North America, exhorting them to mend their ways. Solomon, however, replied that he could not add anything further to the remarks and expostulations of the American press, which, he believed, was amply able to cope with that particular subject.

It was then announced by the first man and woman, Adam and Eve, that a grand ball would be given at the Morse Auditorium on the following evening, which would be an entertainment for all nations and races who once upon a time dwelt on Mother Earth. The music for the occasion would embrace the primitive musical instruments of the far-off Esquimaux on the North, the Kamschatkan fiddle, the Patagonia banjo, the Chinese tom-tom, the Ethiopia ding-a-ling, besides the more interesting violin and piano forte of modern educated society. Adam was delegated to play the part of old Dan Tucker, and the whole population of Jupiter smiled as this fact was announced.

More of this romantic story will be told in subsequent editions of this journal.

The following names of Confederate military telegraphers have been proposed for admission to the Pleiades Club:

James S. Burruss, N. C. Pamplin, Joseph McGovern, Lee A. Angel, John Bragg, John W. Brown, Junius Potts, Allan Howard, John Crowley and Joseph W. Kates.

Burruss was with General Jubal A. Earley in the fighting around Staunton, Virginia, and at Appomattox. Union operator, Ed. Schemerhorn, arranged the parole for him. They met again about 1885.

N. C. Pamplin was operator for General Lee, and a grand operator, and a marvel with his pen.

Joseph McGovern was at Appomattox also. He was a miserable sender and knew it, and on one occasion he had to send a long special to Pamplin, who did not break him at all. At the end of the special McGovern said: "Nick, you are a fine operator." Nick replied: "Joe, it behooves me to be."

Potts did a great deal of tapping on United States wires for the Confederacy. John Crowley was chief operator for the Confederate force and managed to escape Appomattox and reached Lynchburg.

Joseph W. Kates had charge of Confederate mines in Charleston harbor and was very successful. He was General Beauregard's operator around Charleston. John W. Brown was operator at Fort Pulaski, between Savannah and the ocean, and was the last to leave the fort. He was fifteen years of age at the time.

Mistaken Identity.

A severe storm prevailing in the Northwest had devastated the telegraph wires between Portland, Ore., and Vancouver, B. C., and it became necessary for the telegraph company to engage the services of its peaceful, but untiring competitor, viz.: Uncle Sam's fast mail, to assist in bridging over the trouble. A bundle of messages was to be sent to a convenient office on the other side of the break, and the stars of the office were detailed to make a copy of the business. Everybody knows how easy it is to turn back a duplex, so that the sending operator's manipulations will not go further than the receiving instrument on the same table.

"Judge" Lawrence Connell, who was called "Judge," because he at one time had been judge of a horse race, was detailed to do the receiving, and Ben Durkee, once the champion telegraph operator of the world, sat down to do the sending. Ben was a very lively sender and started out at a rapid gait, but the "Judge" was equal to the emergency. Mr. Durkee signed the letter "E" in sending this business, and had transmitted thirty or forty messages when Connell looked over at him and artlessly inquired: "I wonder who the darned fool is up at Vancouver who signs 'E.'" It had not dawned upon the "Judge" that "E" was sitting just a foot and a half from him.

Chicago Western Union.

W. A. Holub, transfer agent, in the service thirty-five years, has just returned from vacation.

Samuel Heroux, call clerk, in the service since 1869, is at present away on vacation. "Sam's" service goes away back to Gen. Anson Stager's time.

Miss Steinbrecher, of Manager Mink's office, is contemplating taking her second trip to the Coast in the near future, while W. T. Griffin, of Manager Mink's staff, expects to visit his son Gerald, the famous Irish singer, who is now in New York after a tour of Australia, New Zealand, and the Philippines.

LETTERS FROM OUR AGENTS.

New York Postal.

Mr. E. P. Tully, manager of the New York office, is taking a two weeks' rest.

C. E. Stump, manager of the Dock Street (Philadelphia) Postal office, was a recent New York visitor while on his way to Woods Hole and Nantucket, Mass. Mr. Stump visits these locations every year while on vacation. While in New York he called on his numerous friends, including Managers Ruffer and Donovan of the New York City branch offices.

C. W. Pearson, the old-time and military telegrapher, manager of the 446 Columbus Avenue office, has a son with the boys in France. If he makes as fine a record as his father did during the Civil War he will return to the United States with many decorations.

New York Western Union.

Thomas M. Brennan, chief clerk, left on vacation August 25, to be absent two weeks.

Donald McDonald, formerly of the bookkeeping department, is now a gunner on a United States transport to France. He is a son of R. C. McDonald, an old-time telegrapher, and Catherine Lahey, who were married from 195 Broadway. R. C. McDonald is doing his bit for the government by acting as a censor in the United States Navy.

F. V. Houston, a member of the night operating force, died August 17.

Among recent visitors to this office were Miss Josephine Draddy, clerk from the Commercial News Department, Charlotte, N. C.; Guy Dickey, Commercial News Department operator, Commercial Exchange, Atlanta, Ga.; Seikichi Miyai, electrical engineer, Tokyo, Japan; C. H. Addison, formerly chief operator at Detroit, now in the real estate business.

On August 19 the Service Department Baseball Club defeated the Multiplex Department by a score of 7 to 0, and on August 26 the Service Department defeated the Clerical Department by a score of 10 to 1. The Service Department Club is now in the lead in the league championship.

In our issue of August 16 we recorded the fact that J. E. Palmer, an old-time and veteran telegrapher, father of G. E. Palmer, chief operator of the main office, and of J. R. Palmer, inspector of the Eastern Division, had been retired from further service on August 1. Mr. Palmer will make his home at Pelchertown, Mass., which is about 200 miles from Kirby, Vt., where he was born in 1842. Mr. Palmer learned telegraphy at Pittsburgh and spent many years of his life in that city. In 1883 Mr. Palmer went West, holding the position of manager at various offices in the Mountain and Pacific Divisions of the company. He returned to Pittsburgh about eight years ago. Mr. Palmer opened the first office at East Liverpool, Ohio, in 1868. His numerous friends unite in the hope that he may live many years to enjoy his well earned retirement. He had been identified with the Western Union interests for forty-nine years, during over thirty years of which time he represented the interests of this publication wherever he happened to be located.

Philadelphia Postal.

Aurora currents were detected on wires extending westward out of Philadelphia on several days between August 9 and 15. The effect was similar to that noticed in September, 1909, but not as severe.

Herbert T. McNichol, son of night chief operator J. A. McNichol, who enlisted in the Signal Corps Reserves, is now located with the first telegraph battalion "Somewhere in France."

Among the new arrivals here are John J. Zimmerman, Michael Pennacchio, Wm. R. Bechtel, George H. Cooper and John Colbert.

Manager George F. Lord, of our Pottsville, Pa., office, was quietly married to Miss Eva Wisner, of Pottsville, August 20.

Those who have returned from their vacations are: Assistant wire chief Charles S. Almes, city foreman W. M. Fitzgerald, timekeeper Miss Mabel Murphy and chief operator's clerk Miss Linnie Eisenhart.

Josiah W. Dyer, who was for a number of years manager of the American District and Postal Telegraph and Cable companies at Philadelphia, died on August 21 at the Presbyterian Hospital, this city, after a lingering illness. Mr. Dyer was in his seventy-fifth year and was probably one of the best known telegraph men in the country. He is survived by a daughter, who is well known by the Philadelphia telegraphers. Mr. Dyer learned telegraphy when a boy, in 1856, as messenger for the House Printing Telegraph Company at Trenton, N. J., and when still quite a young man was given charge of an office on a line from New York to Philadelphia that consisted of one wire. When the first Atlantic Cable was laid he copied the congratulatory messages between Queen Victoria and President Buchanan, posting them in the office window, which was brilliantly illuminated for the occasion. The commencement of the Civil War found Mr. Dyer stationed at Perryville, Md., forwarding telegrams from there to Annapolis by boat, telegraphic communication having been destroyed by the secessionists. While superintendent of the Bankers and Brokers Telegraph Company in Philadelphia from 1865 to 1871 he operated the same on coöperative principles successfully for one year. From 1871 to 1881 he served the Western Union Telegraph Company, managing several branch offices. He then devoted his entire energies in developing patents. In 1885 he reëntered the telegraph service as manager of the Bankers and Merchants Telegraph Company until that company was absorbed by the Postal Telegraph Company, returning to the Western Union for a short period until called upon to take charge of the American District and Postal Company's office at Third and Chestnut Streets. During his telegraph career he has been expert on the House, Hughes and combination printing and Morse systems. Mr. Dyer introduced the Laws system of tickers to furnish the gold quotations in Philadelphia. While devoted to business Mr. Dyer was never too busy to find time to counsel or assist other young men just starting their careers. The facilities that the public enjoys today are due to the efforts of many earnest workers, of whom Mr. Dyer was one, in the pioneer days of the telegraph and telephone. During the Centennial Exposition in Philadelphia in 1876 Mr. Dyer was in charge of the telegraph service at the exposition.

Boston Western Union.

John W. Kane, formerly day operator at the local weather observatory and who was one of the first to answer the call to the colors, has been spending a few days with his folks at South Boston, having just returned from France.

The Western Union Educational Society has a membership in the three hundreds, regardless of the fact that a goodly number have enlisted in the army and navy.

Mike King and Joseph Stanton have resigned to enter the Signal Service.

There are upwards of a thousand operators at Harvard awaiting their turn to be sent "some where." In the telegraph business there are no slackers.

Dallas Western Union.

H. L. Browne of this office has been appointed chief operator of the Houston office to succeed A. W. Craighead, advanced to the position of division wire chief.

H. L. Rohling, wire chief at Houston, has been appointed wire chief at Dallas, and T. H. Chase has been appointed to fill the wire chief vacancy in the Houston office. These changes followed the resignation of I. D. Hough, division wire chief, to become superintendent of telegraph of the El Paso and Southwestern System as previously announced in these columns.

Rubber Telegraph Key Knobs.

No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fit snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. Address orders to TELEGAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York.

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Telephone Building, 24 Walker Street, Room 1129, Daily 9 a. m. to 2 p. m.
Saturdays 1 p. m.

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NEW YORK, SEPTEMBER 16, 1917.

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Electrolysis.

The plant department of the Western Union Telegraph Company has just issued specifications on the subject of electrolysis, which, for clearness of expression and completeness of scope, give the pamphlet the character of a textbook. In this issue we began the publication of these specifications and we feel safe in saying that they will be received by electrical engineers with much satisfaction, since they bring the subject up to date.

Electrolysis as an engineering problem was unknown before the advent of electric railways, but when these appeared and began to use grounded return circuits trouble at once began for telegraph and telephone companies, in the destruction of underground cable sheaths and other metallic structures by the subtle enemy.

Much time and experimentation have been expended on the problem of finding means of neutralizing the destructive effects of these underground stray currents. These specifications are very illuminating on the whole subject and form a complete work of reference for the instruction and guidance of those who have the problem to deal with.

Our Educational Articles.

All young and ambitious telegraphers who wish to advance, and not tie themselves down to the instrument, should join the increasingly large class studying the various educational articles now running in this paper. These articles cover the telegraph, the telephone, wireless, etc., and are really complete courses of instruction on these subjects. They are based on standard works and are therefore authoritative.

We frequently receive letters commending the educational work we are carrying on, yet we fear that many young people do not realize what advantages and benefits they are missing by not giving more earnest attention to the efforts we are making to help them. They should study the articles as diligently and systematically as they studied at school, and after a little time they will be surprised to find what a store of knowledge they are possessed of.

It is a good practice to set aside a half hour, or more if the time can be spared, each day to study these educational articles. Besides acquiring additional knowledge one is slowly and surely fitting himself for advancement.

We are constantly giving thought as to what will be helpful to our many readers. They do not all think alike but the majority are young men who are eager to better their condition in life—of that we are sure.

In these times "pull" is a negligible factor in business life. It may work in politics but not in the telegraph. For a man to get ahead he must have knowledge and the only way to acquire knowledge is to study.

We wish to impress upon our studious readers the importance of the articles published in each issue under the head of "Educational." They deserve the most careful study, and these, together with our articles on "Efficiency Engineering in the Telegraph Service," form the most complete course of instruction ever offered to telegraphers.

The Submarine Problem.

One of the greatest needs of the Allies, in dealing with the submarine menace, is some means of discovering the presence of these agents of destruction and avoiding them when their presence is known. Naturally the use of electricity and magnetism is often suggested as possible means of meeting the situation, but many of these suggestions come from persons who are not familiar with the first principles.

Magnetism has been carefully studied for many years and the laws governing its application may be found in any book on the subject, and there is a general misconception regarding the electrification of water and the atmosphere. The idea of deflecting torpedoes from their course, or arresting their motion by magnetism, is an attractive one, but nothing of any promise has yet been developed, and as far as "charging the sea with electricity" is concerned, to effect a similar purpose, nothing of any merit has yet been accomplished. The use of alternating or pulsating currents seems to offer greater possibilities, and any one experimenting along this line has a better chance of evolving something of promise.

Avoid Discouragement.

We are many times told in the course of a year by members of the profession that in these busy days there is absolutely no opportunity for the writers to forge ahead; that the chance of promotion is so slight that it is not worth working for; and that the higher positions are handed to favorites.

Notwithstanding the fact that this opinion is entertained by a large number of employes, we would not for a moment believe that such is the case. To prove to the contrary it is only necessary to look into the careers of those who occupy the higher positions in the telegraph, the telephone and the railroad service.

Everyone knows that most of the presidents and executive officials of the railroads in this country were former telegraph operators. We need go no further on that point except to add that history repeats itself and twenty-five years from now we will find that the officials occupying the same positions were former telegraph operators.

The same is true of the telegraph. Twenty-five years ago, more or less, Mr. Newcomb Carlton, president of the Western Union Telegraph Company, was a telephone clerk; Mr. Edward Reynolds, vice-president and general manager of the Postal Telegraph-Cable Company, was a telegraph operator in a branch office; vice-presidents J. C. Willever, G. W. E. Atkins, W. N. Fashbaugh, and their associates, of the Western Union Telegraph Company, were either telegraph operators or clerks; vice-presidents Chas. C. Adams, Chas. P. Bruch and W. I. Capen, of the Postal Telegraph-Cable Company, were telegraph operators; all of the general managers of the Western Union Telegraph Company and all of the general superintendents of the Postal Telegraph-Cable Company began their business careers as operators. The same is true of the superintendents.

The telephone is not even an exception. Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company, and Mr. C. H. Wilson, general manager of the Long Distance Lines, were former telegraph operators, as were also Mr. H. J. Pettengill, president of the Southwestern Telegraph and Telephone Company; Mr. B. E. Sunny, president of the Chicago Telephone Company; Mr. W. T. Gentry, president of the Southern Bell Telephone and Telegraph Company, and many others.

The man who possesses the idea that there is no opportunity for him to forge ahead does not deserve promotion and it is quite certain that he will not secure it while he entertains these ideas. Such beliefs drag a man down, when he ought to have thoughts that will elevate him. They are an admission of failure at the outset.

Every man who is ambitious should set his aim and keep it constantly in view. He should not allow himself to be influenced by the failure of others, but keep right ahead along his own line of work, being careful that he is pursuing a reasonable and proper course.

Telegraph and Telephone Patents.

ISSUED AUGUST 14.

1,226,434. Signaling System. To J. F. D. Hoge, Jersey City, N. J. (Call box system.)

1,236,567. Telephone Attachment. To H. V. Jobe, Roll, Okla.

1,236,575. Telegraphy. To I. Kitsee, Philadelphia, Pa.

1,236,576. Telegraphic Transmission. To I. Kitsie, Philadelphia, Pa.

1,236,613. Telephone System and the Like. To J. Skinderviken, Chicago, Ill.

1,236,858. Telephone Exchange System. To T. G. Martin, Chicago, Ill.

1,236,859. Automatic Telephone System. To T. G. Martin, Chicago, Ill.

1,236,876. Telephone Attachment. To J. Rock and G. Sinkovic, New York.

1,236,886. Insulator for Telegraph and Telephone Wires. To A. C. Sorensen, Webster, N. D.

ISSUED AUGUST 21.

1,237,208. Automatic Telephone System. To A. E. Keith, Chicago, Ill.

1,237,214. Two-wire Automatic Telephone System. To G. E. Mueller, Chicago, Ill.

1,237,433. Automatic Telephone System. To S. R. Williams, Jr., New York.

1,237,496. Telegraphone. To C. K. Fankhauser, Marietta, Ohio.

1,237,531. Telephone Exchange System. To A. E. Lundell, New York.

1,237,672. Telephone Bracket. To W. I. Miller, Cleveland, Ohio.

1,237,933. Microphone with Carbon Powder Fall for Strong Currents. To G. B. Marzi, Cornigliano, Ligure, Italy.

Stock Quotations

Following are the New York closing quotations of telegraph and telephone stocks on September 13:

American Tel. and Tel. Co.	114½
Mackay Companies	80¼-82⅛
Mackay Companies, pfd.	64-64½
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2½
Western Union	89

PERSONAL.

Mr. Gerard Swope, vice-president of the Western Electric Company, New York, has been visiting Japan and met with an enthusiastic reception from electrical people wherever he went. On June 6 he gave a dinner—in Japanese fashion—for the heads of departments of the Nippon Electric Company in Tokyo. The Nippon Company is the Japanese allied company of the Western Electric Company.

Mr. Seikichi Miyai, electrical engineer to the Imperial Department of Communications, Tokyo, Japan, who has been in this country studying the telegraph and telephone systems, will sail for Europe the middle of this month. He will spend a few weeks in England, France and Spain and then return home.

Captain Richard D. Prescott, Signal Corps, U. S. R., formerly inspector general of telegraphs and telephones for the Panama Government, but for the past several weeks signal officer at Camp Meade, Md., has been relieved as signal officer at that camp and ordered to the Panama Canal Department at Ancon, Canal Zone. Captain Prescott was a New York visitor for a few days last week.

Dr. Charles N. Haskell is a well known physician of Bridgeport, Conn. He is an old-time telegrapher and in his day worked in almost every large office in the country. He was chief operator for the North American, at Minneapolis, Minn., and later was chief operator for the Western Union Company at Springfield, Mass. He studied medicine while working at the key in New York City thirty years ago, since which time he has practiced his chosen profession. He is now a specialist in mental and nervous diseases. In his office at Bridgeport may be found all of the up-to-date telegraph instruments, including a Vibroplex. The doctor loves to keep in practice but, being as good a physician as he was a telegrapher, he will probably never again have occasion to sit at a key professionally. Doctor Haskell learned telegraphy when but eight years of age and at the time, 1870, was declared to be the youngest telegraph operator in the United States. He won the third prize in a fast-sending tournament in 1883.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Major Chas. P. Bruch, vice-president of this company, spent some time in Washington recently in connection with military affairs.

Mr. C. G. Knapp, chief clerk to general superintendent G. W. Ribble, Atlanta, Ga., has been appointed manager of this company's office at Montgomery, Ala., vice A. T. Vaughan, resigned.

Mr. L. A. Dudley, of the Los Angeles office, who is also an author of considerable ability, has been appointed night chief operator of the El Paso, Tex., office of this company.

Mr. Charles Weydman has been appointed chief operator at Buffalo, N. Y., vice J. W. Sullivan, deceased, and Mr. George P. Wyckoff has been appointed day traffic chief.

Managers Appointed.—C. B. Alcutt at Brewster, Fla; J. D. Rathbun, Monrovia, Cal.; Mrs. V. E. Butner, Winslow, Ariz.; Edward Schwartz, Joliet, Ill.; J. A. Moseley, Thomasville, Ala.; Chas. McKee, Newport, Tenn.; W. H. Woslager, Cedar Rapids, Ia.; O. A. Horton, Ann Arbor, Mich.; Miss C. Thompson, Moultrie, Ga.; J. W. Tatum, McKinney, Tex.; B. P. Bemis, Glen Rock Hotel branch, Asheville, N. C.; F. M. Garner, Hot Springs, Ark.; and H. T. Smith, Jr., 1249 Wisconsin Avenue branch, Washington, D. C.

Jeremiah W. Sullivan, aged fifty-seven years, chief operator of this company at Buffalo, N. Y., died in that city, August 30. Mr. Sullivan had been in the Postal Company's service for thirty years. He was a native of Hartland, N. Y., and learned telegraphy on the New York Central Railroad. He became chief operator for the Postal in Buffalo in 1884, and was a faithful employe. He had the faculty of making and retaining the friendship and esteem of all those who were under his supervision.

Mr. H. A. Lanier, manager for the Postal Telegraph-Cable Company at Norfolk, Va., in remitting to cover his subscription for another year, writes: "We hardly have time during these busy days to enjoy the Age at the office, but we carefully take same home, where we are not molested and get all the good things out of its pages."

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Mr. W. N. Fashbaugh, vice-president in charge of traffic, has returned to his office from a trip which took him as far as Utah, visiting the offices at Cleveland, Chicago, Omaha, Denver and Salt Lake.

Mr. L. McKisick, assistant to the president, returns to his office on September 17 after a vacation spent in Colorado.

Mr. T. W. Carroll, general manager of the Eastern Division, New York, is absent on vacation.

Mr. L. H. Beck, division plant superintendent, Atlanta, Ga., was a recent New York visitor on company business.

Mr. W. H. McKeldin, chief operator, Washington, D. C., who has been on sick leave for several months, is again at his office.

Mr. J. L. Brady, of the Buffalo office has been appointed manager at Rochester, N. Y.

A baby chewed on a triple cord of a telephone and caused a loss of an hour and three-quarters in time to effect repairs. A wet boquet was laid on a cord and caused a loss of ten hours' service, and a wet sponge caused an interruption of twenty-five minutes. In another instance whiskey spilled on a cord caused a suspension of two hours and fifteen minutes.

CANADIAN NOTES.

N. S. MacDonald, night manager of the House of Commons Office, Great North Western Telegraph Company, Ottawa, Ont., was drowned on August 6.

Good Use of an Advertisement.—The page advertisement of the Great North Western Telegraph Company which appeared in the September 1 issue of Telegraph and Telephone Age is being framed and displayed in many offices of that company in the various Canadian cities and towns.

Conditions on Telegraph Forms in Canada.

The Board of Railway Commissioners of Canada has, according to the *Canadian Railway and Marine World,* dismissed the application of the Great North Western Telegraph Company, the Canadian Pacific Railway, and the Grand Trunk Pacific Telegraph Company for an order approving conditions on telegraph forms on which messages to be transmitted are written. Leave, however, was reserved to the applicant companies to apply for a stated case for the opinion of the Supreme Court of Canada upon the questions of law involved. The changes which the companies desire to have made would make the same conditions prevail between the telegraph company and the addressee of a message, as exist between the company and the sender, and also that the same conditions should prevail in the transmission of a message over connecting lines as between the sender and addressee and the company originally receiving the message for transmission. The companies also desire to limit the liability for damages in the case of repeated telegrams to $200. At present the liability is limited to 50 times the amount received for sending and repeating.

THE TELEPHONE.

Mr. H. J. Pettengill, president, Southwestern Telegraph and Telephone Company, St. Louis, Mo., was a recent New York visitor.

Majors J. J. Carty, chief engineer of the American Telephone and Telegraph Company, and F. B. Jewett, chief engineer of the Western Electric Company, have been assigned to duty at Washington for consultation with the Chief Signal Officer of the Army.

The Telephone in Japan.—The Japanese Diet has voted a large appropriation for the extension of the telephone system in Japan.

The First Telephone Medal.

In an item in our September 1 issue the statement was made by Mr. J. G. Case, the old-time telegrapher and official, now living in Kirkville, N. Y., that he was under the impression that the medal awarded to Dr. Alexander Graham Bell at the American Institute Fair in New York, in 1877, was the first one awarded for the invention. We have since learned that Dr. Bell was awarded gold medals at the Centennial Exposition in Philadelphia in 1876 for speaking telephone and for visible speech, which precede the one referred to by Mr. Case by one year.

Other medals awarded to Dr. Bell were: Royal Cornwall Polytechnic Society, the James Watt silver medal for the telephone, 1877; Massachusetts Charitable Mechanics Association, gold medal for the telephone, gold medal for visible speech, 1878; Society of Arts, London, Royal Albert silver medal for his paper on the telephone, 1878; Republic Francaise Exposition Universelle Internationale, Paris, gold medal for the telephone and a silver medal, 1878; Society of Arts, London, Royal Albert silver medal for his paper on the photophone, 1881; the Karl Koenig von Wuerttenberg gold medal Society of Arts, London, Royal Albert gold medal for his invention of the telephone, 1902; John Fritz gold medal, 1907; Franklin Institute of Philadelphia, Elliott Cresson gold medal for the electrical transmission of speech, 1912; David Edward Hughes gold medal and a silver medal, 1913; American Institute of Electrical Engineers, Thomas Alva Edison gold medal, 1914.

Long Distance Talking in the Army.*

The United States Army field telephones have both receiver and transmitter in one piece, and the operator is signaled by pushing a button in the side. These telephones rest in a box and may be quickly disconnected and shut in their boxes when it is necessary to break camp. The field switchboards are compact and comparatively light, and may be made ready for shipment in quick order.

The wires for the system are usually strung along on top of fence posts and on slender iron-shod poles, which require but a sharp pull to remove them as quickly as they were put in. When a line is to be erected quickly, a reel of wire is carried by one man on horseback, preceded by another horseman carrying a supply of poles, which he thrusts into the ground without pausing as the two advance. Additional supplies are brought up by other horsemen. A well trained squad of mounted Signal Corps men can run a new line of wire forty or fifty miles long inside of half a day. When laying wire in wooded country, two men carry a light reel between them on an iron bar and pay out the line as they run along. About every quarter mile a fresh pair of troops wait to bear the burden. Behind the reel carriers run a squad of men with long poles, who tuck the wire beneath the shrubs and trees, so that it will remain both firm and invisible.

The grounded return is used in modern field telephone construction, and therefore each line requires but the erection of a single wire. In a well established camp every commissioned officer is instantly available to call by telephone, while the outposts are usually supplied with stations.

There is a special type of instrument used by scouting parties which is known as a "service buzzer." It may be used anywhere by driving a metal stake into the ground and connecting the other terminal to a wire fence or even to a barbed wire entanglement. Often barbed wire is unreeled as the parties move forward, and the instruments will work satisfactorily providing the wire does not come into physical contact with water or with a metal ground. When it is not possible to secure a wire for communication, signals may be received in the wireless code by making certain connections on the instrument.

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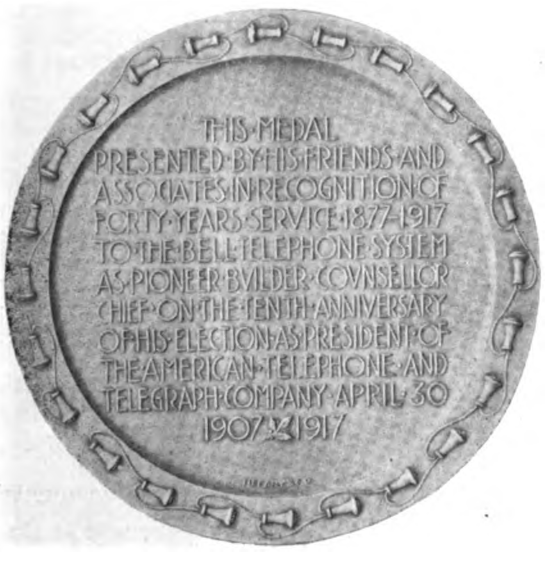
* *The Telephone News.*

Medal to Mr. Vail.

The accompanying illustrations are of the medal recently presented to Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company by a few of his old friends and associates to commemorate his forty years of service to the Bell telephone system and the tenth anniversary of his election as president of the American Telephone and Telegraph Company. Mr. Vail began his official connection with the corporation in 1878 and was elected president of the American Telephone and Telegraph Company April 30, 1907.


THIS·MEDAL
PRESENTED·BY·HIS·FRIENDS·AND
ASSOCIATES·IN·RECOGNITION·OF
FORTY·YEARS·SERVICE·1877-1917
TO·THE·BELL·TELEPHONE·SYSTEM
AS·PIONEER·BVILDER·COVNSELLOR
CHIEF·ON·THE·TENTH·ANNIVERSARY
OF·HIS·ELECTION·AS·PRESIDENT·OF
THE·AMERICAN·TELEPHONE·AND
TELEGRAPH·COMPANY·APRIL·30
1907·1917

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager, and Mr. David Sarnoff, commercial manager, New York, were again in Washington last week on matters pertaining to wireless service.

Mr. Lee Lemon, purchasing agent, New York, has returned from his vacation spent with his family at Beach Haven, N. J.

Miss T. N. Brown, secretary to Mr. E. J. Nally, vice-president and general manager, New York, is making a trip through the Cape Cod and other sections of New England.

Mr. G. Harold Porter, assistant commercial manager, New York, is enjoying his vacation at Chatham, Mass.

The Marconi factory, located at Aldene, N. J., is working under high pressure on government orders. The large two-story brick building which formerly housed the manufacturing department of the Marconi organization has, since April, been greatly enlarged. The floor space is now over four times that previously found sufficient and the factory staff of designers, draftsmen, mechanics and electricians, which a few months ago totaled only about 225, has rapidly grown until at present two shifts, consisting of some 800 employes, are in full operation. Radio sets for all purposes are being constructed in large quantities.

Institute of Radio Engineers.

A meeting of the Institute of Radio Engineers was held in the Engineering Societies Building, New York, September 5, at which Professor L. A. Hazeltine, of Stevens Institute, Hoboken, N. J., presented a paper on "Oscillating Audion Circuits."

Early Commercial Wireless Service.

One of the earliest efforts toward establishing a commercial wireless service on the American continent was undertaken by the United States Army between Nome and St. Michaels, Alaska, across Norton Sound, a distance of 107 miles. These stations were put into successful operation as early as August, 1903.

How Radio Apparatus Is Sealed.

In the recent past we have often read of the sealing of radio apparatus not in actual use by the government, but how the sealing process is accomplished is not generally known.

Heavy wire is wrapped around the poles of the spark gap and the ends of this wire are joined with wax bearing the great seal of the United States of America. Heavy prison penalties are provided for the breaking of this seal. The wire short-circuits the spark gap and makes it impossible to produce a spark. The impression of the great seal is made in red wax on an ordinary piece of paper.

Peroxide of Lead Detector.

The peroxide of lead detector consists of a pressed pellet of peroxide of lead placed between a blunt lead point and a platinum plate. The pressure of the lead point is varied by an adjustable spring tension. The device is in reality an electrolytic cell, and when it is connected in series with the local battery and head telephones it exerts a back pressure upon the voltage of the cell. If these two E. M. F.'s nearly balance and the detector is connected directly in series with the antenna circuit, the incoming signal will destroy the balance of the opposing E. M. F.'s and cause an audio-frequent current to flow through the head telephone. This variation of current has been found to be of sufficient amplitude in many cases to operate a recording instrument direct without the use of an intermediate relay.—*Wireless Age.*

Crystal Rectifier.

According to the *Wireless Age,* a synthetic crystal rectifier may be prepared as follows: Take one part by weight of powdered sulphur and four parts of finely divided lead, both of which should be chemically pure to secure the maximum sensibility. Mix these elements thoroughly and place them in a test tube, but, in order to allow for expansion, do not fill more than half of the tube. Hold the tip of the tube in the flame of a Bunsen burner or an alcohol lamp. The mixture will soon become incandescent and as soon as this takes place, remove the tube from the flame and allow the incandescence to spread through the mass. Keep the open end of the tube away from the flames in order that the gases generated may not ignite, although no serious harm will result from their doing so. Allow the tube to cool, then break it away from the crystalline mass inside. Break this into convenient pieces and mount in a crystal cup or in some other approved fashion.

Practical Wireless Telegraphy.

This book, by Elmer E. Bucher, instructing engineer of the Marconi Wireless Telegraph Company, New York, is the last word in wireless textbooks. It furnishes much information of utmost value in regard to the very latest styles of wireless sets now in use, and which has not appeared in print before. It is the first wireless textbook to treat each topic separately and completely, furnishing a progressive study from first principles to expert practice. Starting with elementary data, it progresses, chapter by chapter, over the entire field of wireless—fundamentals, construction and practical operation.

The 340 illustrations alone, specially drawn, form a complete diagrammatic study and impress upon the reader's mind a pictorial outline of the entire subject. Many of these illustrations reveal details of construction of the newest types of sets and apparatus never before published.

Practical Wireless Telegraphy is a practical man's book from cover to cover and *up to the minute.* It is 6 by 9 inches in size and contains 330 pages and 323 illustrations. Price $1.50 per copy.

For sale by TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

Diaphragm Telegraph Sounder.

The diaphragm sounder which is manufactured by the Railways Labor-Saving Device Company, Davenport, Iowa, is making friends among telegraphers very rapidly. Every one who sees one of the sounders in actual operation is seized with a desire to possess one, and many operators are buying them on their own account, without waiting for their companies to purchase. These operators look upon such purchases as a good investment as it saves them a great deal of time and labor in not having to look after local batteries.

The Serial Loan Association.

THE SERIAL BUILDING Loan and Savings Institution, 195 Broadway, New York, whose advertisement has appeared in this publication for many years, is the depository for funds of telegraphers in all sections of the country. A telegrapher at a distant point informs us that "while the Institution is doing a splendid work for the New York telegraphers in providing them with homes, we, living at distant points, are greatly benefited by its operations inasmuch as we receive five per cent. on our deposits and it has the additional advantage that we think twice before withdrawing our money whenever we imagine we need it, as we would likely do if the money was on deposit in a local bank at our elbow. This may be a little thing but it means many dollars to the depositor. In addition to this we can save our money in the New York Institution and purchase a home wherever we happen to be located, the certificate of deposit in the New York Institution being sufficient security to effect the purchase. This all goes to prove that the Serial can be availed of by any telegrapher in America, no matter where he may be located."

OBITUARY.

EDWARD H. JOHNSON, aged seventy-two years, a former telegrapher, and for many years associated with Mr. Thomas A. Edison in the introduction of the latter's early inventions, died at his home in New York City, September 10. Mr. Johnson was instrumental in introducing automatic telegraphy and was at one time president of the Magnetic Club. He was one of the most prominent figures in electrical circles from 1875 to 1900, since which time his health had failed him. Mr. Johnson is survived by his wife, a son and two daughters.

B. A. EDWARDS, aged thirty years, an operator at Portland, Ore., died in that city, August 16.

TELEPHONE CONSTRUCTION, INSTALLATION, WIRING, OPERATION AND MAINTENANCE. By W. H. Radcliffe and H. C. Cushing, Jr. A guide for the installation of telephone exchanges in buildings and small towns. An extremely practical book. One hundred and sixty-five pages and 120 illustrations. Price $1.00.

For sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

CURRENT IN DIVIDED CIRCUITS.

The law of distribution of current in a divided circuit is, in effect, as follows: The strength of current in the branches of a divided circuit is inversely proportional to the respective resistances of each branch. In other words, the strength of current in each of such branches will be found by dividing the potential difference at its terminals by its resistance.

For example, if, in Fig. 1, we assume the e. m. f. of the battery to be four volts, and the resistances of branches *A B C* to be four, six and twelve ohms, respectively, the joint resistance of which would be two ohms, the total current strength in the circuit at the poles of the battery (neglecting its internal resistance), will be, according to Ohm's law, $\frac{4}{2}$; that is, two amperes, which current will be distributed among *A B C* according to their respective resistances.

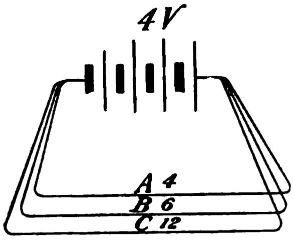


FIG. 1.

Thus *A* will get $\frac{4}{4} = 1$ ampere; *B*, $\frac{4}{6} = \frac{2}{3}$ ampere, and *C*, $\frac{4}{12} = \frac{1}{3}$ ampere, the sum of which fractions of the total current strength is, evidently, two amperes.

DISTRIBUTION OF CURRENT IN TELEGRAPH WIRES IN MULTIPLE.

The manner in which the foregoing laws are concerned in the explanation referred to will now be considered.

Suppose the case of a gravity battery of 100 cells, each cell having an internal resistance of two and one-half ohms, making in all 250 ohms, and four telegraph wires, each having a total resistance of 1,000 ohms, connected up with the battery. The joint resistance of those wires, as may be ascertained by the rules given, is 250 ohms.

With all the wires closed at one time, the total resistance of the circuit, including the internal resistance of the battery, will then be 500 ohms. The electromotive force of each cell of the battery being approximately one volt, or 100 volts in all, the resulting strength of current yielded by the battery at such times will be, according to Ohm's law, $\frac{100}{500} = \frac{1}{5}$; that is, .2 ampere. Distributing this current among the four wires obviously gives each .05 ampere, since the resistance of each wire is the same.

With three wires open and one closed, the total resistance of the circuit, including as before the battery resistance, will be 1,250 ohms, which gives a strength of current of nearly .08 ampere; that is, about $\frac{3}{100}$ more current than was furnished each wire when the other three wires were also closed.

(To be continued)

Telephony.

The condenser in the common battery subscriber's set also produces the so-called "booster" effect, the action of which is very interesting. Fig. 1 is a diagram of a subscriber's set with the various parts as they are connected up for service. The primary of the induction coil and transmitter are directly connected to the line, while the secondary of the induction coil is connected through the receiver, transmitter and condenser.

In considering the action of the circuit from a talking standpoint, the ringer may be neglected. As explained before, the talking current is produced by the action of the voice changing the resistance of the transmitter. A decrease in the transmitter resistance will cause an increased current to flow through the primary of the induction coil in the direction of arrow *a*. The condenser, being initially charged, discharges through the secondary of the induction coil in the direction of arrow *b*. This current induces an opposing current in the primary winding, the direction of which is shown by arrow *c*, which, it will be noticed, is in the same direction as the current designated by arrow *a*. The reverse of this happens on an increase in transmitter resistance, but in both cases the action of the condenser produces an induced current in the primary winding of the induction coil in the same direction as the main current through it, giving the "booster"

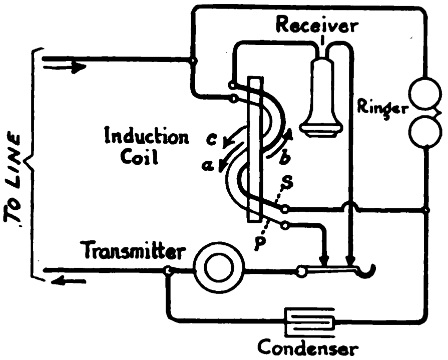


FIG. 1.

effect, which produces an increase of approximately 10 per cent. in the maximum distance over which a message could be transmitted without it.

The condenser is also used to prevent the burning of relay contacts. It is also used to produce one telephone and two telegraph circuits for simultaneous use over two line wires.

(To be continued)

Radio Telegraphy.

CLOSED OSCILLATING OR PRIMARY CIRCUIT.

In the preceding example it has been assumed that there was one discharge in each alternation or two discharges per cycle, that is, 1,000 wave trains per second. In some cases, however, the circuit may be arranged so that there is a charge and discharge in every other alternation—that is, only one discharge per cycle—which, with a 500-cycle alternator, would give only 500 wave trains per second. In both cases, however, the wave trains are separated by equal intervals of time. When the wave trains are thus separated by equal intervals of time the note of the spark is said to be pure. In some cases, however, it is possible to charge the condenser two, three or even more times per alternation, and hence four, six or even more times per cycle, and then it is said that these are multiple discharges. Under these circumstances the intervals of time between the wave trains will not in general be all equal and the note will not be pure. The pure note is often very desirable, although not always necessary in practical work.

WAVE TRAIN OR SPARK FREQUENCY.

The number of wave trains per second is called the wave-train frequency or the spark frequency. If the alternator frequency is 500 cycles per second and there is a discharge once in every alternation, or 1,000 discharges per second, the spark frequency is 1,000 per second. It must be noted that in general the alternator frequency and the wave-train frequency are not the same; in fact, they may be very different, as in the case of multiple discharges mentioned in the last paragraph.

If the spark frequency is, say, 120 per second, as from a 60-cycle alternator, it is said to be low, but if it is 1,000 per second, as from a 500-cycle alternator, it is said to be high. There are certain advantages in a high spark frequency which appear both at the transmitting and at the receiving stations. If the closed circuit condenser is charged 1,000 times per second to a certain potential, it is evident that more energy will be required than if charged only 120 times, the formula for the energy being $1/2\ C\ V^2\ N$, where C is the capacity, V the potential, and N the number of times per second. If the same amount of energy is available in the two cases—that is, if $1/2\ C\ V^2\ N$ is constant, the smaller the value of N the larger must be the value of V, other conditions being constant, and, vice versa, the larger the value of N, the smaller may be the value of V. The earlier practice was to make N small, as 120 per second from a 60-cycle alternator, and V large, as 30,000 volts. The modern practice is to make N large, as 1,000 from a 500-cycle alternator, and V small, which in this example must be about 10,800 volts. It is evident, then, that the transformer secondary and the closed oscillating circuit condenser do not need to be built to withstand the high voltages formerly used and that therefore they may be lighter and more compact; also that the oscillation transformer and antenna do not need the very high insulation which was formerly necessary.

If suitable constants are used in the formula for the energy it is possible to determine the capacity, peak voltage, etc., for any size of set. Let K. W. be the number of kilowatts that the transformer secondary must deliver to the closed oscillating circuit condenser; M. F. the capacity of this condenser in microfarads; V the peak value of the voltage to which the condenser is charged and then discharged as the spark gap breaks down; and cycles the number of cycles per second of the alternator in which there are two discharges per cycle, then—

$$\text{K. W.} = \frac{(\text{M. F.}) \times (V^2) \times (\text{Cycles})}{10^9}$$

Thus, if M. F. is 0.012 mf; V 18,250 volts, peak value; and the cycles 500 with two discharges per cycle, then K. W. will be 2.0. As it is impossible to build a transformer with an efficiency of 100 per cent., it is evident that the armature of the alternator must deliver a larger number of kilowatts to the primary of the transformer than is given by the above formula. The actual number will be found by dividing the secondary kilowatts by the efficiency of the transformer. Thus, if the efficiency were 93 per cent., or 0.93, then the alternator armature output, or the transformer primary input, would be $\frac{2.0}{0.93} = 2.15$ K. W. By simple changes in the above formula it is evident that when any three of the quantities are known the fourth can be found.

QUESTIONS IN RADIO TELEGRAPHY.

When wave trains are separated by equal intervals of time, what is the character of the note emitted?

Under what circumstances will the intervals of time between wave trains not produce a pure note?

Are pure notes always necessary in practical work?

The Western Union Multiplex.

The Western Union multiplex system is based upon the principle of distributed use of the line and synchronous operation; that is, synchronous distributors, controlled by driving, or tuning forks, assign the use of the telegraph circuit to two or more operators for simultaneous sending and receiving. It is also arranged for one transmission in each direction, in which case the full line time is utilized by the single transmission.

The system is suitable for operation over open wire, underground or submarine cable of any length over which a line relay can be operated satisfactorily.

Its flexibility permits of a large number of methods of operation, the method of operation to be employed in a given case depending upon the operating and traffic conditions imposed.

Some of the various methods of operation which have been standardized are as follows:

1. Two-Way Method of Operation. — This method of operation provides one traffic channel in each direction simultaneously without involving the use of duplex balancing apparatus. Its traffic-carrying capacity is equal to, roughly, forty-five words per minute in each direction, or a total of ninety words per minute for the line. This system is operative over any length of line not requiring the use of repeaters. For economic reasons it is ordinarlly not recommended for lines longer than 500 miles.

2. Double Duplex Method of Operation.—This method of operation provides two traffic channels in each direction. Simultaneous transmission in each direction is obtained by means of the duplex balance. The traffic-carrying capacity of the circuit is, roughly, forty-five words per minute per channel, ninety words per minute in each direction, and a total for the line of 180 words per minute.

3. Triple Duplex Method of Operation.—This method of operation provides three channels in each direction, simultaneous transmission in two directions being obtained by means of the duplex balance. The traffic-carrying capacity is, roughly, forty-five words per channel, 135 words per minute in each direction, or a total of 270 words per minute for the line.

4. Quadruple Duplex Method of Operation.—This method of operation provides four channels in each direction, the simultaneous transmission in two directions being obtained by means of the duplex balance. The traffic-carrying capacity is, roughly, forty-five words per channel, 180 words in each direction, or a total of 360 words per minute for the line.

These methods of operation by no means represent the limit of flexibility of the system, for, if line conditions will permit, the number of channels may be further increased. Moreover, it should be understood that the working speed per channel is not limited by the apparatus, but rather by economical operating conditions. Forty-five words per minute is thought to be an economical working speed. Satisfactory operation of the apparatus has been had at fifty-two words per minute per channel on a quadruple duplex, thus making a total of 416 words per minute for the line.

QUESTIONS ON THE MULTIPLEX.

What is the principle upon which the multiplex is based?

What is the two-way method of operation; the double duplex method; the triple duplex method; and the quadruple duplex method?

What is a "channel" as applied to multiplex operation?

Does the quadruple duplex represent the greatest possible use of a wire?

What is the economical working speed of the multiplex?

Shop Talk.

BY THE OBSERVER.

Frequently after the repeater chief has everything in good shape at the set, the operator at the table complains "it's no good." Right now is the time for a visit to the table to see that the sounders are properly adjusted; no bolts missing, nor screws loose. With proper supervision very few screws will work loose, but bolts will be stolen and many operators widen the play of the sounder's lever beyond practical limits. Those who make a practice of taking parts of the equipment from the sets should be severely reprimanded. In many cases, thumbscrews, rubber knobs, etc., are taken only to find that they will not fit the sending machine, or some other object the purloiner has in stock. The result is putting a good key, sounder, relay, etc., out of order, whereas had the party asked the repeater chief for a particular piece, it is reasonably certain that a piece could be found in the scrap box, which every wire chief should have for minor repairs. It is indeed a pity that there is not more uniformity in the thread and sizes of the various screws used in telegraph instruments. If that were done many quick restorations of stolen and lost parts could be effected.

To describe a case in point relative to the non-uniformity of screw thread: Take off the thumbscrews from an old Freir neutral or polar relay and mix them. Now replace them and you will get my point. If you do not care to lose a lot of time, it is better to place them in order as you take them off and restore them in the same positions. Of course the late patterns do not vary as did the old, but the fact that there are instructions from headquarters not to take off parts of instruments will necessarily prevent the wire chief carrying in his repair box parts of the new equipment; therefore, when you take any part thereof, you necessitate the removal and perhaps junking of what would be a first class instrument. Do not remove any parts, or mistreat the equipment. It is dishonest and unmanly. For a few cents most any hardware dealer can give you a perfect fitting piece and you need have no guilty conscience when asked if you saw the missing piece.

Another point that should not be lost sight of is: The instruments on the floor sets should be kept bright and clean. Now I have been thinking about this matter and, seriously speaking, I do not think the wire and repeater chief should fight this alone. Why would it not be a good plan to have the janitors remove the heavy dust daily and the regular operator put in a few minutes now and then to keep the equipment in a bright and clean condition? Of course, I refer to the lighter circuits where there are some idle minutes. The heavier circuits will, of course, be looked after by the sub-chiefs. When I make this suggestion I feel that I am only suggesting a reasonable action and one that is practiced in other professions.

(To be continued)

Specifications Covering Electrolysis.

The Western Union Telegraph Company has recently issued very complete specifications covering Electrolysis, which bring knowledge on this subject, and practice, up to date. The specifications describe the principles underlying the electrolytic corrosion of underground metallic structures by stray electric currents, and outline means for the mitigation and prevention of such corrosion. They are issued in two parts. Part I includes a theoretical consideration of electrolysis and describes the causes of stray currents and the condition under which such currents cause corrosion, and Part II applies more specifically to the protection of Western Union plant.

Owing to the importance of this subject we will publish the specifications in full, in instalments, beginning with this issue, as follows:

Electrolysis.

PART I.

PRELIMINARY. All metallic structures placed in earth in which electric current is flowing are liable to corrosion and injury from what is known as electrolysis. Since the telegraph company has many miles of important metal sheath cable and pneumatic tube construction placed underground in various parts of the country where there are also electric railways using ground return circuits, it follows that the proper maintenance of such cable and tube plants depends to a large degree on the care which is taken to guard against electrolysis dangers.

SCOPE. These specifications describe the principles underlying the electrolytic corrosion of underground metallic structures by stray electric currents, and outline means for the mitigation and prevention of such corrosion. They also prescribe the measures that shall be taken for the protection of the telegraph company's cable and pneumatic tube systems. For the sake of brevity, reference is usually made only to cables, but it should be understood that whatever applies to cables applies equally well to pneumatic tubes, and that the electrolysis supervision of tubes is identical to that of cables.

Part I of the specifications includes a theoretical consideration of electrolysis and describes both the causes of stray currents and the conditions under which such currents cause corrosion. The information necessary for the detection and explanation of dangerous conditions is described in considerable detail. The more usual means of overcoming dangerous conditions are then outlined and a number of examples given to help towards a better understanding of their application.

Part II of the specifications applies more specifically to the protection of Western Union plant. It outlines the organization for taking care of electrolysis. It prescribes the standard apparatus for electrolysis surveys and the tests to be made. Methods of reporting are also suggested, as well as the procedure that should be followed in arranging for protection:

GENERAL DISCUSSION.

ELECTRIC CONDUCTION. Electric currents may be conducted in two ways; first, by "metallic" conduction, and second, by "electrolytic" conduction.

Metallic conduction occurs whenever an electric current passes through a metal and is characterized by the fact that heat is produced but no chemical changes take place. Examples of metallic conduction are the passage of electric currents through the wires and rails of an electric railway system, or through the conductors of a telegraph circuit.

Electrolytic conduction occurs whenever an electric current flows through a solution of an acid, alkali or salt. Such solutions are known as electrolytes and the conducting terminals by which the current enters and leaves the solution as electrodes. The distinguishing characteristic of electrolytic conduction is a chemical change which takes place in the electrolyte and usually in one or both of the electrodes. The flow of current through the solution of a gravity battery such as used for telegraph work is an example.

DEFINITION OF ELECTROLYSIS. Electrolysis is the process by which chemical changes take place during the electrolytic conduction of an electric current. These changes usually consist of decomposition of the electrolyte and of the electrode from which the current enters the solution.

In the arts, electrolysis is usefully applied for electroplating and the refining of metal by electro-deposition.

In the field herein discussed, however, electrolysis is the harmful decomposition of underground metallic structures, caused by the conduction of electric currents.

CONDITIONS ESSENTIAL FOR ELECTROLYSIS. In order that electrolysis may occur, there must be a flow of electric current from one terminal to another through an electrolyte. This electrolyte must be a chemical compound that can be altered by the action of the current.

The electric current may be due to an external electromotive force or to a local difference in potential caused by the terminals and electrolyte themselves.

An example of current caused by an external force is the current used to charge an electric storage battery, or the current which leaks off electric railway systems to other underground metallic structures.

Locally generated current results usually from electrodes of different materials or electrolytes of different combinations. It exists whenever a primary or storage battery discharges and also occurs in metallic underground structures which are chemically impure or non-uniform in composition.

As a rule, electrolytic corrosion of underground telegraph systems is caused by electric current from an external source. Of course, electrolysis from local action sometimes exists, but its occurrence is rare and of minor importance.

ELECTROLYSIS OF CABLES AND TUBE PLANTS. In the electrolysis of cable sheaths and pneumatic tubes, the moisture of the soil with its dissolved acids, salts and alkalis is the electrolyte, the cable sheath or tube one of the electrodes and metallic structures such as water or gas pipes or the rails of an electric railway the other electrode. Corrosion takes place at the electrode where the current leaves. For example, a cable sheath is usually not affected where current enters it, but where current leaves the sheath and enters the soil extended corrosion may take place.

The amount of corrosion taking place depends on three factors—(a) the strength of current, (b) the duration of the current and (c) the kind of metal. For the same amount of current the corrosion of lead is 3.7 times as rapid as that of iron.

Self-corrosion, due to locally generated currents, usually occurs only in wet soils that contain considerable acid or salt in solution. It is most pronounced when the soil contains cinders, coke or other conducting particles which serve to augment the local currents.

Electrolysis manifests itself by a peculiarly characteristic appearance of the sheath or tube where affected. The surface becomes pitted or rough, and is usually covered by a grayish or white deposit. The metal becomes more or less "rotten or punky" and much of it can usually be scraped away with a knife or other instrument.

If a test is made where a cable is being corroded by electrolysis to determine the potential difference between the cable sheath and earth, it will be found that the sheath is positive, which signifies that current is flowing from the cable to the earth. This condition, then, whenever discovered, is the warning sign of electrolysis. Corrosion is always possible where a cable is "positive" to earth.

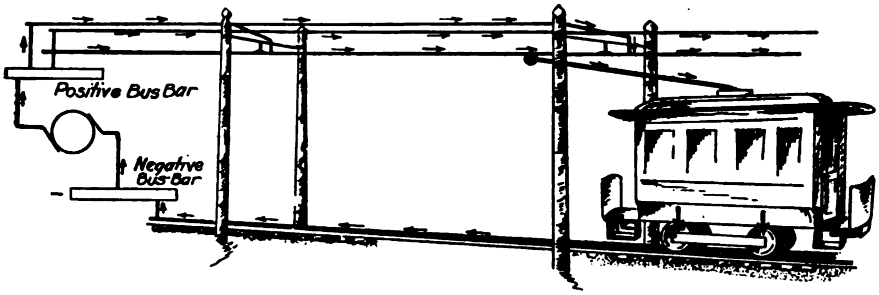


FIG. 1.—SIMPLE FORM OF ELECTRIC RAILWAY.

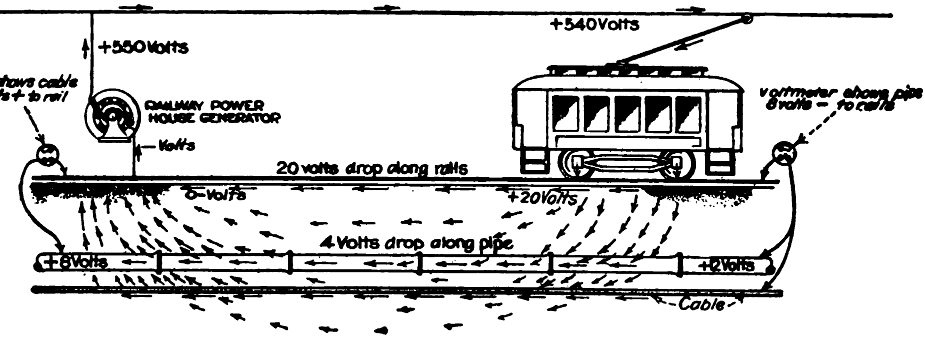

+550 Volts
+540 Volts
Voltmeter shows cable & pipe 8 volts + to rail
RAILWAY POWER HOUSE GENERATOR
– Volts
Voltmeter shows pipe & cable 8 volts – to rails
20 volts drop along rails
0-Volts
+20 Volts
4 Volts drop along pipe
+8 Volts
+12 Volts
Cable

FIG. 2.—TRACK LEAKAGE FROM ELECTRIC RAILWAY.

Cause of Stray Currents in Cable and Tube Systems. Electric currents which arise from some source external to the affected cable or tube system are commonly spoken of as "stray currents." They usually originate from electric railways, which use "direct" current for propulsion purposes. Electrolysis from "alternating" currents is very slight and may be practically disregarded.

The simplest form of electric railway is shown in Fig. 1. Current supplied by a generator flows out through the overhead trolley wires or insulated third rail, passes through the car, and then returns via the rails. As the rails are in more or less perfect contact with the ground, however, not all of the current stays in them, but a certain proportion leaks off to the earth and returns to the generating station by some other route. The proportion of current that leaks off depends on the conductivity of the rail return, the conductivity of the earth and the contact resistance between the rails and earth.

In order to make effective use of the conductivity of the running rails, the joints between the rails are always bridged in some manner. Copper rail bonds are most commonly used for this purpose, but welded joints between rails have been used during recent years with very good success. When the current is high, or the distance over which it must be conducted is great, copper conductors, known as negative returns, are run parallel to the tracks, so as to reinforce their conductivity.

Even with negative returns a very appreciable amount of resistance is left in the return circuit, depending on the size and number of rails, the character of maintenance, the conductivity of the negative returns, etc. Consequently a flow of current in the return circuit causes a certain drop in potential, which may force some of the current to leave if there happen to be any shunt paths available. When there is another metallic underground structure in the vicinity, a certain amount of current will flow in it, the amount flowing depending on the total amount of current in the railway system and the relative conductivities of the various paths offered.

Fig. 2 illustrates a simple system in which part of the return current is carried by a paralleling cable and water pipe. This shows the manner in which current leaves the rails and returns to the generating station, and illustrates the potential drop along the rails, cable and pipe, and between them. In a case such as illustrated, the water pipe and cable would be corroded near the power station, where the current flows into the earth and back to the generator. This is the point where the cable is most positive to earth.

MITIGATION OF ELECTROLYSIS. The mitigation of electrolysis can be accomplished by (a) reducing the flow of current through the earth and metallic structures buried in it, and (b) reducing the positive areas of such structures.

The current on the cable sheath may be decreased by (1) increasing the conductivity of the electric railway return circuit, (2) increasing the resistance of the leakage path from rails to earth, (3) increasing the resistance of the path between earth and cable, and (4) increasing the resistance of the cable sheath, as by providing breaks in its continuity.

The positive areas of cable sheath may be decreased by providing suitable conductors, known as drainage wires, for leading the current out and back to the power station, so that less current will flow directly into the earth.

The specific application of these various schemes is more completely discussed in later portions of these specifications. Before any remedial measures can be applied, it is always necessary first to consider the influence which various factors of electric railway operation have on cable systems, and then to make a complete investigation of the neighboring electric systems and of the electrolytic condition of the cable.

(To be continued)

Morse Schools: Main Line Copying.

BY H. E. ZINSZER, BOSTON, MASS.

Main line practice is by far not the quickest way by which a student may learn telegraphy.

A student placed on a main line wire to get "what he can!" is better off than the student, who must practice alone; but the student who has the opportunity of practicing under the intensive supervision of a competent instructor, will learn better and quicker than either the one alone, or the one who is "sitting in" on a main line circuit.

Main line copying has its advantage. It places the student in a position to learn the methods that are used in the handling of messages. It also has its disadvantages. As long as the student is able to read what is being sent he copies, but when he misses he waits until he is able to follow, and then he copies again. As a result he misses more than he copies. As long as he copies his mind is wholly concentrated, but when he misses his mind is in a state of relaxation. The inference is more relaxation and less concentration, and the student only learns during that period of concentration.

However, if two students of nearly equal ability work with each other each one exerts almost all of his energy to send well when he sends, and to copy everything sent when he receives. There is present a feeling of obligation which is absent when he is copying from a main line circuit. Again, the inference is, the period of concentration enlarged nearly to its capacity, while the period of relaxation becomes very much decreased and because the mind develops mostly during this period of concentration the student learns quicker, provided the instructor supervises intensively.

In most every stage of advancement the instructor must constantly be on the alert for habits that soon become a hindrance to the student's progress; but especially must the student be constantly advised which practices are obsolete and also how to express himself in the least possible number of words and still be easily understood.

When the instructor assumes that he is one station and that the student is another he places himself in the best possible relation to teach the student. As a result the student only hears the best examples of telegraphy and wire language, and at the same time is warned against the things fast becoming extinct.

These methods constitute "intensive supervision" and if followed are bound to be a big factor in making operators, rather than letting them make themselves, and not alone making them but making them quickly and well.

Engineering Council.

An engineering council, representing the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical Engineers and the American Institute of Electrical Engineers, has been formed to provide the means for united action upon questions of common concern. A committee, called the American Engineering Service Committee, has been appointed to invite the co-operation of all engineering societies. It is at present devoting its attention to the procurement of men for special service for the Government.

The office of the Council is in the Engineering Societies' Building, 29 West Thirty-ninth Street, New York. Mr. Calvert Townley is secretary.

Mr. J. W. McMahon, manager for the Western Union Telegraph Company at 12 West Thirty-first Street, New York City, in remitting to cover his subscription for another year, writes: "I consider the AGE an asset to the telegraph fraternity and I would be at a loss without it."

Origin of the Western Union Telegraph Company.

(Concluded from page 398, September 1.)

The remaining 258 shares is to be issued to Isaac Butts on the payment of $1,200 to this Company, and is to be delivered to him on his procuring a release from the contractors for constructing the line, and from persons claiming under them by assignment, or by guaranteeing, with satisfactory security, the said Telegraph Company against all claims from said contractors and those claiming under them as aforesaid, or by any other proceeding by which such claims should be effectually barred.

Fifth. That the present Directors of the said Company, and all the officers thereof, shall remain and continue to act as such Directors and officers of the new Company organized under this Resolution, until others are duly elected or appointed in their places respectively.

Sixth. That said Company shall and doth commence as a body corporate this twentieth day of January, 1854, and shall terminate on the first day of April, one thousand nine hundred and fifty-one.

And be it further

RESOLVED: That the above Resolutions having been adopted by a majority of the said Board of Directors, a certificate thereof in due form shall be proved or acknowledged and filed and recorded according to the requirements of the said Act, passed June 29, 1853, entitled *"An Act to amend an Act entitled 'An Act to provide for the Incorporation and Regulation of Telegraph Companies,'" Passed April* 12, 1848.

This certifies that the foregoing are true and correct copies of Resolutions passed or adopted by a majority of the Board of Directors of the New York and Mississippi Valley Printing Telegraph Company, at a meeting held at the office of the Secretary of the said Company, the twentieth day of January, 1854.

IN WITNESS WHEREOF, the President and Secretary of said Company have hereunto subscribed their names, and caused the seal of the said Company to be hereunto affixed the day and year last above written.

[L. S.]

HENRY S. POTTER, *President.*

ISAAC R. ELWOOD, *Sec'y.*

We, the undersigned, being a majority of all the Directors of the aforesaid New York and Mississippi Valley Printing Telegraph Company, do certify, that at a meeting of the said Board, duly convened, held at the office of the Secretary of the said Company in the City of Rochester, on the twentieth day of January, 1854, the foregoing Resolutions were adopted by a majority of the aforesaid Board of Directors, and that the above specifications in said Resolutions contained, that is:

1. Of the name assumed to distinguish the Company and to be used in its dealings, and by which it may sue and be sued:
2. Of the general route of the telegraph line owned and used by said Company, designating the points to be connected:
3. Of the capital stock of said Company and of the number of shares into which such stock is and shall be divided:
4. Of the names and places of residence of the shareholders and the number of shares held by each of them respectively: and
5. Of the period at which said Company shall commence and terminate:

Are in all respects full, true and correct.

IN WITNESS WHEREOF, we have pursuant to the statute in such case made and provided, made this certificate under our hands and seals, at the City of Rochester, in the County of Monroe, and State of New York, this twentieth day of January, in the year of our Lord, one thousand eight hundred and fifty-four.

HENRY S. POTTER, [L. S.]
ISAAC R. ELWOOD, [L. S.]
F. CLARKE, [L. S.]
HIRAM SIBLEY, [L. S.]
ISAAC BUTTS, [L. S.]
W. H. CHENEY, [L. S.]
J. MEDBERY, [L. S.]
J. B. STILLSON, [L. S.]
E. P. WILLIS, [L. S.]
WM. ALLING, [L. S.]

CITY OF ROCHESTER,
IN MONROE COUNTY.

On the twentieth day of January, 1854, personally before me, the subscriber, appeared Henry S. Potter, Isaac R. Elwood, Freeman Clarke, Hiram Sibley, Isaac Butts, William H. Cheney, Joseph Medbery, Jerome B. Stillson, Edmund P. Willis and William Alling, known to me to be the persons described in and who executed the foregoing certificate, and severally, each for himself, acknowledged that he had executed the said certificate for the purposes therein mentioned, and the said Henry S. Potter also acknowledged that he executed the foregoing official certificate, as and being President of the New York and Mississippi Valley Printing Telegraph Company, and the said Isaac R. Elwood acknowledged that he executed the said last mentioned certificate, as and being the Secretary of the said Company.

DANL. B. BEACH,
Comiss. of Deeds for said City.

STATE OF NEW YORK,
MONROE CO.
CLERK'S OFFICE, ROCHESTER.

I certify that Danl. B. Beach, Esq., was, at the date of the certificate of proof or acknowledgment of the annexed instrument in writing, a Commissioner of Deeds for the City of Rochester, in said County, duly authorized to take the same; that I am well acquainted with his handwriting, and verily believe that the signature to said certificate is genuine; and that the annexed instrument is executed and acknowledged according to the laws of this State.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seal of said County, this 7th day of Feb., A. D. 1854.

[L. S.] W. B. WILLIAMS, *Clerk.*

STATE OF NEW YORK, }
Office of the Secretary of State, } *ss.:*

I have compared the preceding with the original *Certificates of Incorporation and Organization of* "THE NEW YORK AND MISSISSIPPI VALLEY PRINTING TELEGRAPH COMPANY," with the acknowledgments thereto annexed, filed in this office, on the eighth day of April, 1851, and on the twenty-first day of February, 1854, respectively: and HEREBY CERTIFY the same to be correct transcripts therefrom, and of the whole of said original certificates.

WITNESS my hand and seal of office of the Secretary of State, at the City of Albany, this day of one thousand eight hundred and

Secretary of State.

(The end.)

Instruments Have Feelings Too.

The instruments in a telegraph office took advantage of a lull in business one Sunday afternoon and indulged in a little discussion among themselves as to their experiences.

"How are you feeling?" asked the Key of the Sounder.

"Oh, pretty well," was the reply. "I am rather tired, though, after a hard day's work. I've been in a flutter all day."

"You can't be half as tired as I am," said the Key. "I've been pounded all day until I am loose jointed."

"The man who worked with me last," said the Sounder, "must have been deaf. He made me open my jaws so wide that it was very tiresome, and if he could not hear all that was going on he blamed me and put the screws on me. My tongue was really tired."

"Our friend the Relay had just as hard work as you," rejoined the Key, "but he did not make half as much noise as you did."

"That is true," replied the Sounder, "but he does not have to yell the way I have to. He speaks in whispers and does not waste his energy in noise."

"To change the subject," continued the Relay, "the other day I had a remarkable experience. A fellow by the name of Eitemiller was on the wire and he sent so rapidly that it got me nervous and hot. The air smelled as if something was getting roasted. I was glad when he got through, as it gave me a chance to cool off. But I heard that he knocked several insulators off the poles."

"The other day the Battery, the Key and the Sounder got into a three-cornered discussion," continued the Relay.

"I feel very weak today, boys," said the Battery. "I've been worked so hard lately that the strength has been taken out of me. I must have a rest so I can recuperate."

"Yes, I noticed that you did not seem to be up to your usual strength," remarked the Sounder. "When you are weak I notice it always affects me in sympathy, and very often I get blamed for the trouble when it is not with me at all."

"It is a blamed nuisance," chirped in the Key, "to be pounded and yanked around the way I am when either of you fellows get out of sorts. Everyone seems to think that I am at fault if everything does not work just right."

"On my wire, the Stock Yards local," said the Sounder, "they have a lot of hams. They know little more about telegraphy than does the animal from which they are derived. The so called Morse they utter—or rather sputter—is enough to make one weep."

"What is a 'ham'?" asked the Relay.

"I'll tell you what a 'ham' is," interposed the Key. "I know from experience. A 'ham' is an operator who thinks he is a fast sender and hammers the life out of a key if it does not work to suit him."

"There's some fellow at the other end of the wire, now, trying to attract attention, so we had better get busy," said the Relay. "Au revoir, my chums. We will have another chat later."

Avoiding Temptation.

BY J. L. EDWARDS, COLLINGSWOOD, N. J.

A New York clergyman recently sent out a circular letter to a number of prominent individuals asking them what, in their opinion, a young man should do to avoid temptation. Among these persons was Thomas A. Edison, whose characteristic reply was as follows:

"I cannot answer your question, having had no experience in such matters. I have never had time, not even five minutes, to violate any moral or civil law. But if I should hazard a guess as to what a young man should do to avoid temptation, I would tell him to get a job and work at it so hard that temptation would not exist for him."

Consistent with the natural law which prescribes that two substances cannot occupy the same space at the same time, Mr. Edison's preventive of temptation is a perfect one for the very limited number of Edisons in the world—comparatively speaking—whose minds find constant employment in their special occupations. But what of the vast majority of young men who are engaged in the various branches of the many industries whose occupations do not demand constant application of the mind even to gain perfection. Some defence must be provided for them equally effective and durable.

Where can we go for such a defence but to the realms of morality?

Many years ago a young man who was about to enter commercial life went to the Honorable Abbott Lawrence, a noted philanthropist, and a prominent and successful merchant of Massachusetts, of whom he sought advice. Upon making known his mission Mr. Lawrence greeted him cordially and in an impressive tone and kindly manner, gave him this invaluable lesson:

"Young man, base all your transactions on a principle of right; maintain your integrity of character, and in doing so do not count the cost."

With a principle of right firmly established in the mind; a singleness of purpose; determined effort and an eye and a mind intent upon searching out details, any young man may achieve success, where success is possible, and avoid temptation, even though he may have many times five minutes to violate civil and moral law.

FOR CLEAR TRANSMISSION

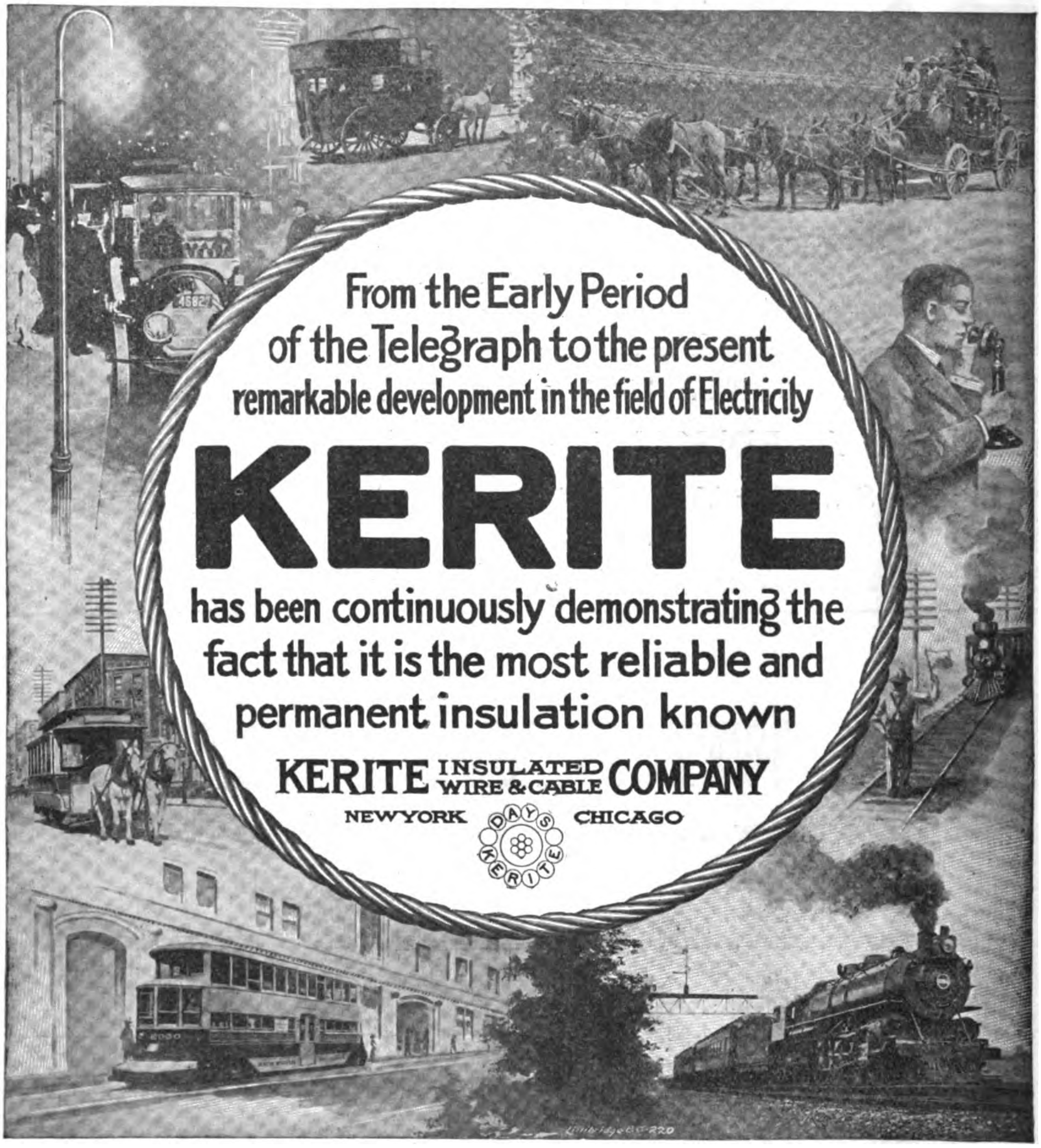
EDISON PRIMARY BATTERY DIVISION
THOMAS A. EDISON, Inc.
30 Church St., New York, N. Y.

HALL SWITCH AND SIGNAL CO.
New York Chicago

MANUFACTURERS OF THE

GILL SELECTOR

THE UNIVERSAL SELECTOR
FOR TELEGRAPH AND TELEPHONE



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KERITE INSULATED WIRE & CABLE COMPANY

NEW YORK CHICAGO

THE RAILROAD.

RAILWAY SIGNAL ASSOCIATION.—The annual meeting of the Railway Signal Association will be held at the Hotel Traymore, Atlantic City, N. J., September 18 and 19. Mr. C. C. Rosenberg, Bethlehem, Pa., is the secretary.

W. S. FENDER, aged fifty-four years, assistant superintendent of telegraph of the Southern Pacific Company, died at El Paso, Tex., August 30. Mr. Fender was a well known telegraph expert on the Pacific Coast and a large circle of acquaintances regret his untimely passing away. The cause of death was heart failure. He was born at Momence, Ill., where interment took place. He is survived by his wife.

MR. M. W. JONES, a former operator at 195 Broadway, New York, who went to Ecuador, South America in 1909 as secretary to the vice-president of the Guayaquil and Quito Railway, has been appointed superintendent of traffic and transportation of that road, with headquarters at Huigra. Since Mr. Jones went to Ecuador he has filled successively the positions of secretary to the vice-president, secretary to the president, chief train dispatcher, trainmaster, chief clerk to the general manager, acting paymaster, general freight and passenger agent, and superintendent of telegraph and telephone, and received his latest appointment August 1. In his new position he will have charge of the operating, traffic and telegraph and telephone departments.

Our Articles on "Shop Talk" Appreciated.

Mr. G. D. Hood, superintendent of telegraph, Chicago, Rock Island and Pacific Railway, Chicago, Ill., has sent a letter to division operators, managers and wire chiefs on that road drawing their attention and commending the articles published in TELEGRAPH AND TELEPHONE AGE under the caption "Shop Talk." The letter is as follows:

"I have noticed copies of TELEGRAPH AND TELEPHONE AGE in some of our relay offices. Of those who have access to copies of this magazine I would like to draw the attention to the articles headed "Shop Talk," on page 349 of the issue of August 1 and page 374 of the issue of August 16.

"A careful reading of these articles will be of material benefit and assistance in locating and removing many of the various troubles that are met with in the testing and regulating service."

"Operators' Wireless Telegraph and Telephone Handbook," by Victor H. Laughter, is a book that every wireless man should possess. It is a complete treatise on the construction and operation of the wireless telegraph and telephone, including the rules of naval stations, codes, abbreviations, etc., and is written in plain language and very thorough in its treatment of the subject. It has 172 pages and 86 illustrations. For sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York. Price, $1.00 per copy.

MUNICIPAL.

International Association of Municipal Electricians.

The International Association of Municipal Electricians, which met in annual convention at Niagara Falls, September 11, 12, 13 and 14, was in session when this publication went to press. The headquarters were at the International Hotel and a large attendance was present. Many valuable papers were read and discussed and much important matter to the Association was disposed of. A full account of the proceedings will appear in the October 1 issue of TELEGRAPH AND TELEPHONE AGE.

MR. W. J. MARRA, custodian of the police telegraph signal system at Holyoke, Mass., having entered other service, his position has been declared vacant by Mayor White. This action was taken to bring the matter to a point where a new appointment could be made.

INDUSTRIAL.

The Western Electric 1918 Year Book.

The new 1918 year book of the Western Electric Company, which is now being distributed to the trade, follows the plan of uniform list price and basic discount inaugurated by the company three years ago. In addition, manufacturers' list prices are shown on certain standard lines for the convenience of any who prefer to buy on the manufacturers' discount, or who desire an independent means of checking invoices.

Another feature of the book is the first section of sixteen pages following the index, devoted to a listing of the company's extensive line of printing plates, window displays, stuffers, lantern slides and other forms of assistance for dealers handling Western Electric appliances.

The book consists in all of 1,160 pages and contains more than 50,000 items. It is what it purports to be, a real handbook of electrical supplies.

THE NEW YORK ELECTRICAL SCHOOL, 45 West Seventeenth Street, New York, whose advertisement appears on another page of this paper, continues to prove attractive to telegraph, telephone and general electrical students. Everyone who becomes a student of this school is its everlasting friend and booster. The practical knowledge acquired more quickly fits a man for the higher positions in the electrical arts than those who confine themselves exclusively to the study of books. This is a case of practice versus theory. Many telegraph and telephone people residing outside of the city have made arrangements for a transfer to New York for a sufficient time to permit them to take advantage of the benefits to be derived from attending this school. All who are interested should send for booklets which fully explain the manifold advantages to be derived in this popular institution of learning.

Efficiency Engineering in the Telegraph Service.

(Continued from page 396, September 1.)

In our previous chapter we recited a few of the essentials that are necessary to make a successful manager. In fact, no official can expect to score success if he does not adhere in a large measure to the principles given in these articles. It is true that the details are voluminous. They are necessary, however, to make a completed whole. No one can make a successful manager, a chief operator, a receiving clerk, a delivery clerk or a telegraph operator if he disregards very many of the essentials enumerated. Some of them, of course, are unimportant. A delivery or receiving clerk can deal harshly with the messenger boys because they are not in a position to resent it. Some of them, however, remember the treatment meted out to them and it becomes an everlasting grievance. Other messengers again pass it by as an incident of life unworthy of their notice.

The one essential that has wrought the greatest amount of harm to officials is what is termed egotism, swelled head, a puffed-up condition, etc. We are told that when a man scores a great success, which includes promotion, it occasionally turns his brain. If he is not strong enough to absorb his success he soon attracts attention and he becomes the object of pity. A vice-president and general manager of our acquaintance in giving out important appointments occasionally would add: "Watch Mr. So and So and see how he acts under the changed conditions. Observe if he is as efficient an official as he was previous to his advancement."

Many men accept promotion as a matter of course. It was to be expected and advancements could not disturb their equilibrium. Others, again, seem to go all to pieces under the increased authority. Former friends and companions are actually insulted in the eagerness of the newly appointed to show that they possess additional power. A man of this calibre is a positive detriment to the service he represents. He must not overlook the fact that he is the custodian of interests, telegraph, telephone or railroad, it matters not which, and he should administer the trust reposed in him to the best of his ability and that ability should not be curtailed by a case of swelled head, for that, after all, means nothing but empty glory or a satisfied something akin to self-importance.

A model official conveys a reprimand to a subordinate in a manner that makes the latter his friend. He gives orders to those within hearing distance in a way that attracts no attention of those not interested in the subject. He handles the affairs of his office in a manner that causes praise from those who witness his simplicity of purpose. When he should become irritated he laughs it aside. When he is informed of some great disaster to the interests he represents the informer is told that now is the time to maintain a cool head, perfect repose and a determination to restore conditions to normal as soon as possible without the slightest confusion. The result is marvelous. The man in charge displays a cool judgment that is at once absorbed by the rest of the staff with the result that the work of restoration proceeds without the slightest hindrance. Reverse the condition. Supposing the official in authority lost his head and became so excited, as is often the case, that everyone of the subordinates became nervous. Under such conditions things that need not be done would be done and things that ought to be done would be neglected. Confusion would be apparent everywhere; everyone would be in the way of everyone else and the guiding head would be lost to reason. The company's interests would suffer. A corporation does not pay an official to get excited when misfortune overtakes the service. He is paid to keep cool and if he is incapable of controlling himself he should at once study the best methods of producing this result, which can be cultivated the same as any other habit. It is true that a company expects the restoration of its property to normal condition at the earliest moment possible, but is it true that excited men can bring about this result with the same readiness and promptness as a staff that is cool in judgment and action?

Everyone should make it his business to study these points and learn to maintain a clear head and cool judgment no matter what emergency arises. This is just as much a qualification in an individual as is his education or knowledge of the business he represents. It is something, however, that is almost wholly neglected by a vast majority of those in authority. It is true that some officials maintain a clear and cool head on all occasions. It may be natural with them. For everyone that measures up to the standard in this respect there are a dozen who do not and it is the latter that ought to make the subject a study. It is only necessary for a man to say to himself when a trying emergency arises: "Now is my opportunity to keep cool and show my staff that I am master of myself and the situation that confronts us."

(To be continued.)

"Labor Is Glorious."

Under this title we have received from Mr. John W. Freeland, Marion, Ohio, the well known old-time and military telegrapher, a poem written by Mrs. J. W. Freeland on the uplifting work of TELEGRAPH AND TELEPHONE AGE during the thirty-five years of the existence of this paper.

Boosting Telegraph Valuations for Taxes.

In the assessed valuation of property in North Dakota and other states for taxation purposes this year, telegraph properties are increased 100 per cent. and telephones forty per cent. State assessors find it easy to increase taxes by burdening the telegraph and telephone. A relay and sounder that cost six dollars two years ago has been boosted in value in North Dakota to twelve dollars.

The Simplicity of Greatness.*

BY WILLIAM H. HAMBY.

Greatness is not in elevation, but in perception. The top of the mountain and the highest rung of the ladder are very good figures of speech; but great men—successful men of every sort do not live up there. They stay on a common footing with the great mass of mankind. They have a common bond with them, only they see and feel more. They feel and understand as other men do, but more penetratingly, more clearly. They know the value of ordinary things in a way ordinary men do not.

And it is this simplicity, this open-minded interest in everything from the bottom up, which has furnished the inspiration for their success. They have been able to see and use all sorts of material; and understanding men, have been able to organize and use them, too.

Of course, there are exceptions, seemingly—very proud, haughty, overbearing men at the head of great institutions and enterprises. There are a few of that sort—a very few. And most of them have become soured self-worshippers since arriving, not before, or else they would not have arrived.

It is noteworthy that the great men we have loved—statesmen, artists, scientists, writers—have had, for the most part, almost a child's simplicity and modesty. They know their worth; some of them were even egotistic in one way or another, but in spirit they were very modest and very accessible.

Getting to the top is a hard, painful job. Getting anywhere is. A man needs every help he can get. He needs, above all, the active sympathetic interest of those around him. He needs a clear vision to help him miss some of the false steps. He needs an abundance of warm enthusiasm and a lasting appreciation of things that count.

All these make it necessary for him to have a sort of universal understanding and sympathy, which will give him directness and simplicity. He is never fenced in by tortuous manners; nor is his view obscured by circumlocution of phrases. He meets men and ideas and circumstances face to face, smiles if they are friendly and sets his jaw if they are not. But, whether friend or foe, he makes no assumption of arrogant superiority. It is merely a matter of man to man.

His work, his environment, his health may modify the customs and habits of the man at the top; but eight times out of ten at heart he is the simplest, friendliest, most approachable, most open-minded, most direct man in the whole concern. For this is the manner of man who gets to the top.

This simplicity of manner and spirit generally comes with an understanding of men. It is something which we can acquire only through contact with men and the spirit of men, only when we are able to appreciate them, their feelings, desires, aspirations. And part of this appreciation may be cultivated by reading good books. Books bring us into intimate contact with the spirit, the worth-while thoughts of great men. For great books, be they philosophical works or novels, are the records of these worth-while thoughts and as Carlyle once said: "All that mankind has done, thought, gained or been is lying in magic preservation in the pages of books." The experience of many will back him up.

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*Western Union Educational Society.

Loads on Poles.*

BY E. R. HANNIBAL.

The vertical load or actual weight of the wires or cables on poles is usually neglected in pole calculation. The horizontal wind pressure on the poles and wires is the chief factor to be considered in determining the stresses on poles. This is merely the product of the wind pressure multiplied by the projected area of the poles and wires. As a rule, pole lines are not constructed to withstand the stresses due to combined wind and ice loads, except at crossings over railroads or power lines. The basis is usually the wind pressure on the poles and bare wires. Storm guys are employed to prevent long sections of line from being wrecked in case of very severe or unusual storms.

After obtaining the actual force exerted by the wind, a pole must be chosen which will withstand this force. Considering only the horizontal load due to wind pressure on the poles and wires, a pole may be considered as a cantilever or beam fixed at one end and loaded at a point at the center of the crossarm system. This load in pounds multiplied by the distance to the ground line in feet gives what is called the actual bending moment. Bending places the wood fibres of the pole under considerable tension, the maximum being at the ground line. Theoretically the safe bending moment of a pole varies with the cube of the diameter at the breaking section. This explains why stout poles are so very much stronger than slender poles. For example, a pole twelve inches in diameter is nearly twice as strong as one ten inches in diameter, and one fourteen inches in diameter has nearly three times the strength of a ten-inch pole.

MENTAL ANGUISH AND WHISKEY.—One of the telegraph companies failed to deliver a message ordering five gallons of whiskey to a customer and the company was sued for $50 damages under the mental anguish law. One of the telegraph officials recommended that the bill be paid for the reason that when a man ordered a drink he needed it so badly that $50 was a low price for the mental anguish experienced.

EXPERIENCE IS WORTH SOMETHING.—One of the higher officials of a telegraph company, not being satisfied with the appearance of the manager in a town in which he was a recent visitor, telegraphed the superintendent as follows: "Have a man with some experience appointed to take charge of this office as soon as possible." The reply that the official received read as follows: "Cannot find a man with experience to take charge of ——— office, which pays boy's wages."

**The Mountain States Monitor.*

Preservation of Poles.

Wood is composed of minute elongated cells fitted closely together and firmly joined by a cement-like coating, says E. R. Hannibal in *The Mountain States Monitor*. When a pole is broken these cells are torn apart. Decay is caused by the action of extremely minute forms of low plant life which produce ferments that actually dissolve the walls of the wood cells. These fungous growths require certain amounts of air, food, moisture and heat, and if one or more of these elements is lacking the organisms cannot live. Early experiments attempted to gain this end by coating the pole near the ground line, where conditions for the growth of bacteria are very favorable, with tar or asphalt, or by setting in concrete. These methods were found ineffectual and it is now generally accepted that preservatives to be effective must penetrate the wood to a considerable depth, be of an antiseptic nature and not easily washed out. Experiments have been made with salt, copper, sulphate, zinc chloride, corrosive sublimate, refined mineral oil products, such as carbolineum, and with creosote or dead oil of coal tar. Carbolineum gives good results and has been used to a considerable extent. It is quite expensive, however, and has practically been replaced by the use of dead oil. According to German statistics the life of poles has been increased from twenty to fifty per cent. by the application of the dead oil treatment, depending upon the method of application.

Rural Telephone Lines.

Practically all country telephone lines are of the one-wire "grounded" type. The telephones universally employed are bridging instruments. On most lines subscribers call one another by means of a set of signals made up of different combinations of long and short rings, one long ring being the signal commonly used for calling the central office.

Good service on such lines demands that they be well built, of good materials, and that they will be maintained reasonably free from "tree" and "hedge" grounds and that the telephones themselves be of good and reliable construction.

Poles can be of any material that will support the lines in a reliable and substantial manner and wire can be of any grade that is double galvanized, though soft iron wire will, of course, give better results than hard steel wire.

Good workmanship in line construction is of even greater importance than good materials. A construction man who knows his business will take second-class materials and construct a well built line that will give reliable service while a "dub" who doesn't know his business will take the best materials in the world and botch them into a slovenly line with poorly guyed corners which will be subject to frequent crosses and never give reliable service. Of course, good materials with good workmanship give the ideal results and is the goal to be striven for at all times.

The best of service on farm lines cannot be had unless the lines are so built as to avoid becoming crossed with one another, or grounded. All line joints must be so twisted as to avoid the possibility of loose connections. Line joints in rusty line wire that must remain in service should be sandpapered and either soldered, or wrapped with tinfoil and taped, as rusty joints in rusty wire are never reliable.

Line joints in new wire that is well galvanized need not be soldered if properly twisted up, but all connections between bare iron wire and insulated copper wire must be soldered or serious trouble is likely to ensue.

However, troubles on country lines due to line faults are as nothing as compared with the troubles and bad service due to poor "grounds" at the telephones.

It is impossible to state just what will afford a good "ground" in all sections of the country. It can be stated, however, that ground rods should never be less than ½ inch diameter by six feet long; that they should always be galvanized and should be driven where at least half their length is in contact with moist earth. Ground rods of clean, new iron, not galvanized, if driven and allowed to rust in the ground will give good results, but rods that are rusty when driven cannot be depended on.

Civil Service Examination for Signal Engineer.

The United States Civil Service Commission announces an open competitive examination for senior signal engineer until October 2. Vacancies in the Interstate Commerce Commission under the act providing for the valuation of the property of common carriers, at salaries ranging from $3,000 to $4,800 a year, will be filled from this examination. Appointments to these positions will be principally for duty in the field. It is desired to secure eligibles having a thorough technical training and several years' practical experience in connection with the design, construction, operation and maintenance of railway signals and interlockers, and having a thorough acquaintance with the methods of appraisal and cost estimating of railway signals and interlockers.

Applicants should at once apply for Form 2039, stating the title of the examination desired, to the United States Civil Service Commission, Washington, D. C.; the Secretary of the United States Civil Service Board, Postoffice, Boston, Mass., Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn., Seattle, Wash., San Francisco, Cal., Custom House, New York, N. Y., New Orleans, La., Honolulu, Hawaii; Old Custom House, St. Louis, Mo.; Administration Building, Balboa Heights, Canal Zone; or to the Chairman of the Porto Rican Civil Service Commission, San Juan, P. R.

Happiness and misfortune stand in a continual balance. Every misfortune is, as it were, the obstruction of a stream, which, after overcoming this obstacle, bursts through with greater force.

MR. JEFF W. HAYES' DEPARTMENT.

The Pleiades Club.

CHAPTER XXI.

PROFESSOR MORSE MAKES A SUGGESTION.

It was the twenty-first day of August, 1917, and the sun poured its resplendent rays upon the planets Mars and Jupiter. Professor S. F. B. Morse was holding a council, the members of which had been, during their lifetime upon earth, some of the brightest lights in the telegraphic profession. They were grave, earnest, and solicitous for the welfare of those left behind. Word had been received in the usual way from the earth, of the shortage in the telegraph ranks, and the menace that this meant to the country during its hour of peril. A similar meeting was in progress on the planet Mars under the auspices of the Telegraphers' Society. "Proferred advice is seldom listened to," but Professor Morse had been requested to obtain the concensus of opinion of the telegraphers on Jupiter relative to the labor question upon earth, and express his own opinion on the matter. Fred Moxon had been asked to perform that same office on Mars, consulting with Professor Morse, on the subject, and then transmit the findings to his brother on the terrestrial sphere. Long and earnestly did the telepathic waves ebb and flow between the two planets, and sage was the advice transmitted to the earth.

Wing Lung Sing, an inhabitant of Jupiter, and who claimed to have been chief operator of the Pekin, China, office, 2,000 B. C., related to his audience that the Chinese language of his day contained but seventeen letters, and the characters in telegraph were made in dots and dashes, but different from the Morse code. For instance, A was one dash, and one dot, B was one dash and two dots, C was one dash and three dots, each succeeding letter having an additional dot to it, so that the letter W, which is the last in the Chinese alphabet, would be one dash and seventeen dots. "Why, I have heard a 'ham' in the South make twenty-seven dots once for the figure six, and the same artist frequently made nineteen dots for the letter P," ejaculated Jim Doody, "and the telegraph companies never charged him up with tolls upon the excessive dots, which showed how lenient they were."

Grandma Eve was much interested in the phonograph, and William G. Bee, of Edison's laboratory agreed to make her one of Edison's latest diamond phonographs so that she and her elderly maiden daughters could have an enjoyable time.

It was stoutly denied by the oldest inhabitant that the electric light and phonograph were known, and were worked centuries ago. "It is merely just another attempt to rob the rich laurels so honestly earned by Mr. Edison," said Adam, "and as father of this vast multitude I must request that my children make no attempt to belittle the great inventor's grand work."

Cain and Abel, who looked like two artless boys, dipped in at this time, with their pockets filled with fruit, which they were munching. Both boys seemed to think a great deal of each other, and all former jealousies and animosities had been forgiven and forgotten.

"Have an apple, papa," said Abel, addressing Adam, but the latter blushed and declined, and grandma Eve smiled sweetly.

Eve was a beautiful lady, despite her age, and spent most of her time in meeting and talking with her large progeny. Adam was the weaker in character of the two, and he seemed to lean upon his spouse for advice and suggestion.

We have still a multitude of well known former telegraphers to introduce to our readers. Among them may be mentioned, at this time: "Gillie" Olmstead, Irving Fitch, W. K. Applebaugh, W. N. Gove, Harry A. Wells, "Tom" Dolan, W. D. Schram, Ed. A. Leslie, Gus Coleman, G. W. Gardanier, W. B. Somerville, E. C. Cockey, Robert Stewart, J. C. Hinchman, W. J. Holmes, Asa R. Swift, C. H. Summers, J. B. Tree, C. A. Darlton, Dave McAneeny, Albert E. Sink, F. W. Gregory, James D. Reid and Alfred Vail. Many others will be recorded in due time and their good qualities explained for the benefit of the present generation.

LETTERS FROM OUR AGENTS.

Boston Western Union.

Day Supervisors E. F. Page and G. H. Batho are absent on account of illness.

William T. Sheridan, of the Boston *Journal* office, has been on the sick list for a month.

Daniel A. O'Connor, of the night force, has been unable to report for duty for many weeks, owing to trouble with the muscles of his arms.

M. C. Harrington, chief repeater attendant, is still confined to his home, suffering a nervous breakdown, having been absent six weeks.

Chief Operator J. B. Rex is meeting the rush with smiling face, and with rare judgment is keeping the force—probably the biggest ever used here—going at top speed and taking care of the great volume of business now directed through this relay point in a manner that commands praise from every side. That every man and woman is anxious to do his or her "bit," and cheerfully set about doing it, speaks well for the organization of the Boston office force.

Night Senior Supervisor T. J. Young has resumed work after six weeks' illness. Owing to poor health Mr. Young has gone on days and is at present filling Supervisor Batho's place. It is not generally known that Mr. Young was the sender on the famous "Fast Stocks" wire which ran out of old 195 Broadway, New York, and was closed down by the company many years ago. Mr. Young has described every football game played at Harvard for the past five years.

W. F. Ayer, a senior operator on the night force, has resigned and entered the navy as first-class electrician. Mr. Ayer is a veteran of the Spanish-American war. Other men from this office who have joined the colors under the navy flag include Messrs. Seate, Jones, Klubock and Benton.

W. M. Powers and C. D. Nesbit are making fine averages on the "J" New York-Boston premium wire. Messrs. Brown and Bramberg on the "M" premium circuit are running neck and neck with the boys on "J."

Benjamin Drew, who has a long service record with the Western Union and with the telephone companies, died on September 4 following a lingering illness. Mr. Drew was forty-five years of age and is survived by a wife and two children.

St. Louis Western Union.

On Sunday, August 19, the Western Union Electrical Society gave an "old fashioned" basket picnic, at Fern Glen, situated about twenty-five miles from St. Louis, on the Missouri Pacific Railway. The train left at 7 a. m. and special coaches were provided for the picknickers. The day was clear and the outing was enjoyed by a large number of employes who attended with their families and friends.

Chief Operator Alger has returned from a two weeks' vacation, F. P. Mullen, assistant chief, in charge of the multiplex, acting as chief operator during Mr. Alger's absence.

The equipment for a multiplex circuit between St. Louis and Memphis, Tenn., is being installed and will soon be working.

Philadelphia Postal.

Those who have returned from vacations are: William P. Bowers, traffic chief, from the seashore and a motor trip with his family to Pottstown, Pa.; telephone operator Miss Anna Fitzgerald; Cashier Charles F. Myers and Miss Gertrude Heenan of our printing department from the seashore; night traffic chief E. H. Locke and Chas. A. Currier, quad chief from Wildwood, N. J.; Manager Charles E. Stump of our Dock Street branch office from Woods Hole, Mass., and a trip to Boston and New York visiting friends.

A son arrived on August 21 at the home of Morris A. Auerbach.

Dallas Postal of Texas.

S. S. Scothorn, who has for a number of years been chief operator of this company at Dallas, recently resigned to accept a first lieutenancy in the United States Signal Corps. Mr. Scothorn's present address is "Somewhere in France," word having been received that he arrived safely. W. A. Simms, formerly assistant chief operator, succeeds Mr. Scothorn. J. N. Lister, who has been night chief operator, succeeds Mr. Simms as assistant chief operator, and L. Z. Skadden succeeds Mr. Lister as night chief operator.

Los Angeles, Cal.

Jackson H. Dorsey, better known in telegraph circles as "Jack" Dorsey, died September 2 at Los Angeles, after a lingering illness. He was well known as one of the best operators and served many years with the Western Union and Postal Telegraph-Cable Companies in Chicago and on the Pacific Coast. He leaves a wife. The funeral was attended by many friends and relatives. Messrs. V. V. Stevenson, superintendent Postal Telegraph-Cable Co., O. B. Weaver, Walter Ogden and F. S. Fall, of the Postal at Los Angeles, acted as pall bearers.

Chicago Western Union.

A. F. Clift, identified with the city lines department for about thirty years as supervisor and wire chief, died August 10. Interment was at Mystic, Conn., his old home.

Benjamin Mann, an old-timer in this office, died August 21.

New York Western Union.

Salvador C. Luque, representing Empresa Telefonica, Pachuca, Province of Hildalgo, Mexico, in company with J. W. McMahon, manager of the 12 West 31st Street office, who understands Spanish, inspected the various departments of this company a few days ago and was much impressed with the magnitude of the equipment, particularly the Multiplex Department. Mr. McMahon introduced Mr. Luque to the various officials and the visit will no doubt long be remembered by Mr. Luque as a very pleasant and profitable occasion.

Practically all of the Clerical Staff of the Division Office who can telegraph are "doing their bit" in this office working as operators for a few hours each day.

Several pensioners have returned to duty to help out during the rush and shortage of operators.

Robert Jablin, supervisor in the service department, had a son born to him on September 9.

Among recent visitors were W. L. Ferris, assistant chief operator, Washington, D. C., and W. F. Webber, wire chief of the Chicago office.

Operators Montequin and Clement of this office, with others, have arrived safely in France.

During the month of August all records were broken in the volume of business handled.

The Western Union Educational Society is planning a campaign for the coming year and the programme arranged will soon be announced.

The Associated Press.

Among recent changes in the telegraph forces of the Associated Press are the following: T. L. Gard, operator at Columbus, Ohio, has been transferred to the Chicago office, and Roy E. Murphy, operator on the Muscatine (Iowa) *Journal,* has resigned. Wyman McKelvy succeeds Mr. Gard at Columbus, Ohio.

The International Association of Leased Wire Telegraphers, New York, held its tenth annual outing at New Dorp, Staten Island, N. Y., Saturday, July 28. There was a large attendance and an enjoyable time was had by all.

The Military Telegraph Corps of '61.

Mr. Richard O'Brien, of Scranton, Pa., the well known old-time and military telegrapher, who was chief operator of the United States military telegraph during the Civil War, has an interesting talk on the Military Telegraph Corps of '61 in the September issue of *The Telephone News*.

"The Telegraph Corps of '61," he says, "was a band of young volunteer operators mostly in cavalry trousers, and in earnest.

"We were not enlisted in the ranks in that first time of military telegraphs. Mr. Lincoln preferred to keep us independent of line officers and directly under the great War Secretary, Stanton.

"The war cloud broke upon us in '61 like it has now, but closer, and, like you, we were called upon to stand by the President. On the nineteenth of April, '61, the mobs of Baltimore destroyed railroads and telegraphs, cutting Washington off from the North. Mr. Lincoln called on Scott and Carnegie of the Pennsylvania Railroad for help to restore communication. I was division operator at Harrisburg, and was one of the first four operators called by 'Andy' Carnegie to Washington, where I found him at the Baltimore and Ohio depot running military trains by telegraph. I worked with him in that duty night and day for a week, while my comrades Bates and Strouse were sent to the War Department and Brown to the navy yard. By May we had run lines to connect the War Department with the Arsenal, the navy yard, Arington, Chain Bridge and outposts.

"It was quickly seen that more operators were needed for the military telegraph, and they were called from commercial and railroad lines, largely from Pennsylvania."

"Today we have hundreds of men trained in signaling, trained in telephone and wireless work, and also trained in the efficiency of business, fully equipped, radiating the results of discipline and knowledge, who can be mobilized in short order and within a few hours' call, ready to take their places in this great war and step off at quick time to 'do their bit' in the fight for liberty and humanity.

"In that early time everything military had to be improvised under immediate war conditions. To illustrate the transition state of the military telegraph from a civil basis to a war footing at that time, let us glance at an instance of connecting up an army by telegraph with Washington, which will show how unprepared the government then was and how dependent on civil sources for assistance.

"General Joe Johnston, with his Confederates, had left the Shenandoah Valley about Harpers Ferry to unite with Beauregard in defeating the Army of the Potomac, under McDowell, in the battle of Bull Run. This left a small Union army under General Patterson 'in the air,' as one might say, in the neighborhood of Charlestown, where he was relieved by General Banks, who continued a retreat. On a Sunday night we were ordered to connect up that army with McClellan's headquarters in Washington. The government did not yet possess the necessary material to build thirty or forty miles of line, but our men appealed to President Sanford of the American Telegraph Company, who hastened to place the materials at our disposal, and we connected up with Banks' army in a day or two. Our operators, Dealy and Pritchard, at the end of that line at night, worked their instruments without shelter in a rainstorm."

In the late summer Mr. O'Brien, on the recommendation of Mr. Carnegie, was assigned as chief operator to Headquarters Department of Southeastown, then under command of General Butler at Fort Monroe. Two days later the Confederates cut his line to Newport News, and he "set it up again."

Mr. O'Brien saw the fight of the "Monitor" and the "Merrimac," the first ironclads, in Hampton Roads; the landing of McClellan's army for the peninsular campaign, for which he helped to run lines and lay the Chesapeake cable; the taking of Norfolk, where he was transferred to lay cable and run wires to Suffolk and other points.

When Grant was made general-in-chief and started all the armies in a grand concerted offensive, Mr. O'Brien was made chief operator, Army of the James, whose route was the James River and whose objective was Petersburg. At this time, 1864, Mr. O'Brien was but twenty-four years of age. He organized the land and cable lines in that field and had communication ready for Grant when he brought the Army of the Potomac from the bloody Wilderness Campaign to City Point.

In this campaign the field telegraph had been developed to the point of reeling insulated wire on the battlefield from muleback and raising it from the ground on lances.

During most of the long siege of Petersburg and Richmond, Mr. O'Brien maintained the James River and Appomattox River cables and the land wires in front of Richmond, while Chief Operator Caldwell relieved him by taking over those in front of Petersburg. Mr. O'Brien spoke of the heroism and sacrifice of his brave boys of the military telegraph in this field; of death by buried bomb. wounds, or close calls by shell and bullet; of capture and long imprisonment in starving prison camps; of heroic escape and scouting ventures. It was on his wire, carried closest to Richmond, that at last the fateful message sped to the War Department: "We have taken Richmond."

But before that Sherman was marching from Atlanta to the sea, and Grant sent Terry's corps and the Army of the Ohio under Schofield to the coast to coöperate with Sherman in the Campaign of the Carolinas. For this important campaign Mr. O'Brien was sent with General Schofield to North Carolina to run the wires and cables for all these forces. It is hardly necessary to say that this large task was efficiently executed. Mr. O'Brien received the personal thanks of Generals Grant, Sherman and Schofield, as well as of his chief, General Eckert, in the War Department.

Mr. O'Brien closes his reminiscences by saying: "The perspective of fifty years may seem to dim the events of the Civil War, but history records that the military telegraph, improvised as stated, strung thousands of miles of lines, handled millions of telegrams (the important ones in a cipher never solved by the enemy), connected all the armies, and assisted materially in the success of the war for the Union. This is not said by way of boasting but merely to set a proper historic mark for our young Bell heroes to aim at and excel with their splendid organization and superb equipment, in the stupendous development effected by the coöperation of the Bell managers with the chief signal officer and the War and Navy Departments."

A Valuable Handbook for Telegraph Engineers.

Telephone and Telegraph Engineers' Handbook, published by the International Correspondence Schools, Scranton, Pa., is one of the most useful books available for electrical and telegraph engineers and students. It does not go into principles or detailed descriptions, but gives tables and rules for quick reference. A few of the most useful tables and descriptions are: Conversion tables; specific gravity; electric and magnetic symbols; resistance of wires; powers, roots and reciprocals; rules for electrical measurement, with diagrams; telephony, with illustrations of telephone apparatus and circuits; telegraphy, with various illustrations, including the Athearn repeater used by the American Telephone and Telegraph Company; simultaneous telephony and telegraphy; wireless telegraphy, wireless telephony, etc.

No student and practical engineer can afford to be without a copy of this useful work.

The book measures only 3¾ inches by 5½ inches, and can therefore be easily carried in the pocket. It contains 398 pages and many illustrations. The price is only 50 cents per copy, which is remarkably low when the value and variety of the contents are considered. Copies may be obtained of Telegraph and Telephone Age, J. B. Taltavall, publisher, 253 Broadway, New York.

Book on the Telephone.

Principles of the Telephone, by C. M. Jansky and D. C. Faber, 160 pages; 125 illustrations cover the following subjects: Elementary electrical principles; magnetic principles; sound; transmitters; receivers and induction coils; signaling apparatus and circuits; the subscriber's telephone set; local battery systems; common battery telephones; faults in substation telephone apparatus; protection of telephone lines and apparatus; installation; party lines; intercommunicating telephone systems.

The simplest of mathematics is employed in the text, and each chapter is concluded with a series of questions on the subject of the chapter.

The illustrations are excellent and show the details of construction of apparatus very clearly.

This book will be of great service to the student as well as to the practical man. The price is $1.50 per copy.

Copies may be obtained from Telegraph and Telephone Age, 253 Broadway, New York.

Digging Up Morse and Marconi.

A Scotchman and a Welshman were arguing as to the merits of their respective countries. "Ah, weel," said the former, "they tore down an auld castle in Scotland recently and found many wires under it, which shows that the telegraph was known there hundreds of years ago." "Ah, ah," said the Welshman, "they tore down an old castle in Wales quite recently, and, mind you, there were no wires found under it, which shows that they knew all about wireless telegraphy in Wales hundreds of years ago."

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NEW YORK, OCTOBER 1, 1917.

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New Method of Teaching Telegraphy.

The idea of teaching telegraphy without reference to the dots and dashes composing the Morse alphabet is novel, but evidently thoroughly practical and successful, according to an interesting article by Mr. C. H. Weiser, printed on another page of this issue. Mr. Weiser has evolved a phonetic system of teaching telegraphy that seems to be giving very satisfactory results and, judging from his account of the work in the training school in St. Louis for operators for the signal corps of the army, it is a decided improvement on the old A B C method.

The modern system of teaching children to spell without first learning the letters of the alphabet has been followed in this case, and if this method of instruction works well in one instance, there is no reason at all why it should not work well in the other.

To many mature minds the idea of learning telegraphic characters individually complete at the outset and eliminating from the mind their composition of dots, dashes and spaces, may seem impossible, but it is being done, and with success. There is no reason why a student cannot learn the letters A, B, C, etc., by this complete sound without considering the number and sequence of dots, dashes and spaces composing them. By the phonetic method of teaching we should say that the time required to learn the art of telegraphy is at least fifty per cent. less than that consumed in the old way, and this saving of time is a very important factor in these days of speed and efficiency. This great gain is borne out by the figures presented by Mr. Weiser in the case of a class taught by him, where a portion of the students began their study in the old way, the other portion taking up the phonetic system. The period of instruction was two months at the end of which time those who in the beginning already knew the code could receive only five to seven words per minute, while those who followed the phonetic system, and had never learned the code, were able to receive fifteen to twenty words per minute.

This is a remarkable showing and no doubt will be of particular interest to the telegraph companies at this time. If their schools can turn out operators at such a rate their difficulties in keeping up the supply of operating material will be greatly reduced.

The Convention of Municipal Electricians.

Of the various electrical organizations of a deliberative character in this country the International Association of Municipal Electricians is one of the very few that have held their annual conventions this year, and the meeting was one of the most successful ever held by that body, from whatever angle it may be viewed. This success, of course, did not come because the officers of the association did not follow the decision of other organizations of like character to omit their conventions this year on account of the unsettled conditions, but rather to favorable circumstances. Everything seemed to contribute to success, and the members no doubt are glad the meeting was held.

The papers presented were of high class and of a practical character, and will aid in putting municipal electrical engineering on a higher level of professional standing.

The association is doing good work among the various municipalities represented in its membership, and the people ultimately get the benefit of the ever widening knowledge of development in this particular field.

The Niagara Falls meeting of 1917 will, on the whole, stand out prominently as one of the best yet held by the association, and its officers are to be congratulated on the successful results of their efforts.

Stock Quotations

Following are the New York closing quotations of telegraph and telephone stocks on September 24:

American Tel. and Tel. Co.	118¼
Mackay Companies	76-77
Mackay Companies, pfd.	63-64
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2½
Western Union	89⅛

Dividends.—The Mackay Companies, preferred 1 per cent., common 1½ per cent., payable October 1; Western Union Telegraph Company, 1½ per cent., payable October 15; American Telephone and Telegraph Company, 2 per cent., payable October 15.

Telegraph and Telephone Patents.

ISSUED AUGUST 28.

1,238,129. Automatic Telephone Exchange System. C. L. Goodrum, New York.

1,238,130. Machine-Switching Telephone Exchange System. To C. L. Goodrum, New York.

1,238,131. Calling Device. To C. L. Goodrum, New York.

1,238,140. Automatic Telephone System. To C. E. Hill, New York.

1,238,141. Telephone Exchange System. To E. E. Hinrichsen and L. H. Johnson, New York.

1,238,153. Loading Unit for Telephone Systems. To G. A. Kelsall, New York.

1,238,163 and 1,238,164. Automatic Switch. To F. A. Lundquist, New York.

1,238,193. Machine-Switching Telephone Exchange System. To J. N. Reynolds, New York.

1,238,194. Automatic Switch. To J. N. Reynolds, New York (for telephone).

1,238,206. Telephone Apparatus. To E. A. Shuler, Chicago.

1,238,261. Switch. To J. F. Cavanagh, Meriden, Conn. (for telephone).

1,238,265. Telephone Exchange System. To H. P. Clausen, New York.

1,238,350. Telephone System. To F. M. Slough, Rochester, N. Y.

1,238,439. Telephone for Transmitting and Reproducing Sounds. To R. Rummler, Wilmette, Ill.

ISSUED SEPTEMBER 4.

1,238,748. Multi-Exchange Telephone System. To H. D. Currier and R. I. Utter, Chicago, Ill.

1,239,011. Automatic Telephone Exchange System. To C. A. W. Holtman, Stockholm, Sweden.

1,239,097. Telephone System. To G. Grabe, Berlin, Germany.

1,239,205. Telephone Exchange System. To T. E. Meyer, Chicago, Ill.

1,239,207. Automatic Telephone Exchange System. To G. E. Mueller, Chicago, Ill.

1,239,587. Measured-Service Telephone System. To R. C. Gifford, Chicago, Ill.

1,239,607. Telephonic Paging System. To N. A. Kurman, New York.

1,239,702. Telephone for Long Distances or for Deaf Persons. To R. Lagus, Abo, Finland, Russia.

1,239,831. Wireless Telegraphy. To F. G. Simpson, Seattle, Wash.

1,239,890. Telephone Stand. To B. S. Cutler, Buffalo, N. Y.

PERSONAL.

Mr. O. C. Greene, formerly superintendent of telegraph of the Northern Pacific Railroad, St. Paul, Minn., expects to spend the winter months at Lansdowne, Pa., which is one of the beautiful suburbs of Philadelphia.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. C. C. Adams, vice-president, New York, has returned from his vacation.

Extensions of Plant.—This company is contemplating considerable extensions to its telegraph and telephone plant in the southern states and Texas during the coming winter.

Mr. F. F. Pursley has been appointed chief clerk to General Superintendent G. W. Ribble, at Atlanta, Ga., to succeed the former chief clerk, Mr. Knapp, who has gone to Montgomery, Ala., as manager.

Mr. C. E. Diehl, manager of the Harrisburg, Pa., office, was in New York this week attending the Supreme Council of the Scottish Rite Masons, thirty-third degree, of which he has been a member for many years.

Managers Appointed.—J. H. Keown, Pontiac, Mich.; C. H. Ashwell, Waterloo, Iowa; C. C. Spencer, Mason City, Iowa; C. R. Hardenburg, Hudson, N. Y.; H. L. Owens, Franklin, Ind.; M. Rosenquist, Kingman, Ariz.; Hugh Mitchell, Redlands, Cal.; A. E. Southard, Biddeford, Me.; W. M. Moore, Fernandina,, Fla.; J. S. Montague,, Cambridge, Mass.; T. R. Irvin, Waynesboro, Ga.; R. W. Whiting, Ocala Fla.; Miss Gertrude Anderson, Braddock, Pa.; J. E. Lane, Buford, Ga.; H. R. Voss, Columbia, Tenn.; Joseph E. Reynolds, Atlantic, Iowa; V. O. Vesey, Lafayette, Ind.; S. G. Kitchen, Stockton, Cal.; A. W. Shiflet, Warren, Ohio.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Mr. Newcomb Carlton, president; J. C. Willever and W. N. Fashbaugh, vice-presidents; T. W. Carroll, general manager of the Eastern Division, and Mr. S. B. Haig, division traffic superintendent, New York, were in Washington, D. C., on September 24 and 25, on business.

A New District has been established with headquarters at Manchester, N. H., covering the states of Maine, Vermont and New Hampshire. Mr. J. W. Reed, superintendent at Philadelphia, has been appointed district commercial superintendent of the new district.

Mr. John S. Calvert, of the office of Mr. J. C. Willever, vice-president in charge of commercial, New York, has been appointed superintendent at Philadelphia to succeed Mr. Reed, transferred. Mr. Calvert, previous to coming to New York two years ago, was district commercial superintendent of the Western Union interests, with headquarters at Richmond, Va.

WASHINGTON, D. C., which has heretofore been included in the fourth district, Eastern Division, has been made independent. Mr. H. F. Taff, the manager, will now have the title of general superintendent and will report to Mr. T. W. Carroll, general manager, New York.

MR. LEWIS DRESDNER, treasurer, New York, will leave October 6 on a trip on company business which will take him as far West as the Pacific Coast. He will stop at all division and district headquarters points and will be absent about five weeks. He will be accompanied by Mrs. Dresdner.

MR. H. W. LADD, general auditor, New York, has returned to his desk after a rest in Maine.

MR. C. P. POLLAK, general superintendent, American District Telegraph Company, New York, is enjoying his annual holiday at Hot Springs, Va.

MR. I. N. MILLER, formerly superintendent at Cincinnati, now retired, was a New York visitor the past week. Mr. Miller was married at Cincinnati on September 11.

MR. C. H. BRISTOL, former general superintendent of construction of this company, now retired, is spending a few weeks in this vicinity visiting friends.

MR. O. L. HOLLOWAY, of New York, has been appointed equipment engineer of the Gulf Division, with headquarters at Dallas, Tex.

MR. A. HELMINGER, assistant chief operator of the Richmond, Va., office, has been transferred to the office of Mr. W. N. Fashbaugh, vice-president in charge of traffic, New York.

MR. A. J. CAMPBELL, formerly wire chief, Montgomery, Ala., has been appointed chief operator at that point, superseding Mr. W. W. Hoskins, transferred to San Diego, Cal.

THE WESTERN UNION BOWLING ASSOCIATION, composed of eight teams representing the executive departments in New York, will open their season at the Grand Central Alleys, in Brooklyn, on Monday evening October 15. The officers of the association are: J. W. Connolly, president; W. A. Kampf, vice-president; C. E. Mobius, treasurer; E. B. Pitt, secretary.

THE CABLE.

MR. G. G. WARD, vice-president and general manager, Commercial Cable Company, New York, has returned to his office after an extended trip to Nova Scotia.

TEST WORDS IN CABLEGRAMS.—By direction of the United States censorship of cablegrams, the serial number, when used, will be the first word in a cablegram, and the test word will be the last word to be used.

RESTORATION OF LEGAL TIME.—The clocks in Great Britain were set back one hour to correspond with Greenwich time on Monday, September 17. In Russia the return to legal time has been deferred until October 14. It was originally intended to make the change on September 13.

WILLIAM GIBSON, aged thirty-seven, unmarried, a telegraph operator for the Commercial Cable Company at London, England, was killed by a bomb dropped from a German airship on September 5, while on his way home from work. Mr. Gibson was a native of London, but had done service for the Commercial Cable Company at the cable station in Ireland and at Fayal in the Azores. He was an expert telegrapher and a lovable character, and his untimely death is mourned by a large circle of friends. This is the fourth death in the staff of the Commercial Cable Company in London so far this year. The other three were Superintendent E. G. Phillips, W. M. Kent, assistant to the manager in England, and Wm. Riley, an excellent operator, who had been in the company's service for thirty-two years.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to September 24 as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany, September 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable) October 1; Yap and Menados (offices closed). October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917.

CANADIAN NOTES.

MR. GEORGE D. PERRY, general manager, Great North Western Telegraph Company, Toronto, Ont., was a recent visitor in New York

THE TELEPHONE.

MR. JAMES ROBB, a vice-president of the American Telephone and Telegraph Company, is known in other circles as Major Robb of the Depot Battalion of the Twenty-third Regiment of Brooklyn. For thirteen years Mr. Robb's military career led him from the grade of private to the rank of captain in the Twenty-third until, in 1913, temporary ill health made it necessary for him to give up his military activities. On July 20 of this year, however, Mr. Robb gained his rank of major when Governor Whitman appointed him to command the Depot Battalion of the Twenty-third.

AUTOMATIC TELEPHONES IN AUSTRALIA.—Orders aggregating 1,000 lines of automatic central office equipment and 1,000 telephones equipped with the dial have just been placed, to be used as additions to the automatic exchanges in Australia. This is the second such order placed since the beginning of 1917, the first one—for 1,800 lines—being received in February.

VALUATION OF TELEPHONE TOLL LINES.—The telephone toll lines in Minnesota, aggregating over ten thousand miles in length, will be valued by the engineering division of the Minnesota Railroad and Warehouse Commission during the coming year. The purpose of gathering this information is to establish a basis for determining a reasonableness of the prevailing rates for toll service.

The First Telephone Medal.

In connection with this subject, which was touched upon in our issues of September 1 and September 16, an interesting fact has just been brought to our attention. In a recent letter to Mr. J. G. Case, of Kirkville, N. Y. (who is mentioned in both articles), Mr. W. A. Eagleson, of the American Institute of the City of New York, refers to the telephone medal awarded by that Institute in 1877 to The Telephone Company of New York, Room 32, Tribune Building. It was the "Medal of Progress."

So skeptical were some of the people regarding the telephone, Mr. Eagleson states, that the floor had to be taken up to prove that there was no one under it talking.

People have certainly learned something since then.

The committee that awarded the Medal of Progress were J. G. Case, now living at Kirkville, N. Y.; Wm. H. Murphy, who died January 11, 1899; and Newton Squire, who died December 10, 1893.

Telephone Stations on High-Voltage Transmission Lines.

In the recent report of the transmission and distribution committee of the Ohio Electric Light Association, the following recommendations for telephone stations were made. A telephone station should be located about every five miles and at points easily accessible. The station should be so constructed and located as to make it unnecessary for the operator to use an insulated platform before using the telephone circuit. Each station should be kept under lock and key in order that trespassers may in no way come in contact with it.

To obtain the greatest degree of protection the following apparatus should be added:

1. Insulating transformer at each station.
2. Combined double-pole fused switch and lightning arrester at each telephone station on the line side of the insulating transformer.
3. Double-pole horn gap across line at each station on the line side of all apparatus for protection of the insulators in the telephone circuit in case of cross between power and telephone circuits after series fuses are blown.
4. Drainage coils should be installed with fuses at each end and the middle of the line.

The telephone set, when not in use, should be left connected by a double-pole switch from the circuit; it should be so connected to the line as to permit the station to be called without having the set connected permanently. This is to be accomplished by an extension bell, removed from the telephone set.

The telephone line should be transposed about every eight miles, but truly equidistant.

The telephone user should be instructed to avoid all metal parts of the telephone set at all times.

The power linemen should consider the telephone circuits with the same respect as the high-tension circuits.

RADIO TELEGRAPHY.

Radio Instruction at Brown University.—During the past summer a radio class has been conducted at Brown University, Providence, R. I., under the direction of Prof. Arthur E. Watson, instructor of electrical engineering.

Wireless Between Argentina and Germany.—A dispatch from Buenos Aires, Argentina, states that the Argentine government has withdrawn permission granted to a German wireless telegraph company to receive wireless messages from the German station at Nauen.

Russian Soldiers and Wireless.

An interesting description is given by a Russian officer of one of the numerous little mobile field wireless outfits operating near the front. The whole wireless station can be unloaded from its auto truck, rigged up, and be ready for work in twenty minutes. The seventy-foot masts are hollow and made in sections, which are screwed together when taken off the truck.

The simple peasant soldiers, many of whom come from remote villages where wireless has never been heard of, are greatly fascinated by the station, and like to stand around when they can get a chance and watch the flashing of the spark and listen to its song. "It sounds like butter in a frying pan," they say. They have coined a nickname for the men in the wireless crew, which, as near as possible in English, is "sparkers," or "the spark men."

Wireless Waves Passing Over Land.

When radio waves travel along the surface of the sea, or of any other good conductor, their fronts stand up nearly vertically. When they pass across stretches of poorly conducting earth, however, the tops tend to gain and the whole wave front tips forward in the direction of motion. Resulting currents in the surface of the earth cause resistance losses, and the waves rapidly become weaker. This is why it is more difficult to send wireless signals over ground than over salt water.

The Telegraph in Mexico.

The Department of Telegraphs of Mexico reports that 248 kilometers of new line have recently been built and 22,538 kilometers put in repair. There are now eighteen wireless stations operated by the government and six more are in the course of construction. Fifty-five newspapers in the republic have been granted a press rate over the national wires. Under the supervision of Mario Mendez, director general of telegraphs, a comprehensive system of telegraph communication is now established throughout the republic.

Phonetic System of Teaching Telegraphy.

BY C. H. WEISER, TELEPHONE ENGINEER ON PERSONAL STAFF OPERATING VICE-PRESIDENT SOUTHWESTERN BELL TELEPHONE SYSTEM, ST. LOUIS, MO.

During my service on the Mexican border I evolved a phonetic system of teaching telegraphy which is now being employed in the army telegraphers' schools in St. Louis, where operators are being trained for the Signal Corps of the army.

A description of the system will no doubt be of interest to your readers.

This system of teaching telegraphy is based upon one or two fundamental facts:

1. That the telegraph instrument speaks a language peculiar to itself and that this language consists of about thirty-five words, which represent the letters, numerals and marks of punctuation.

2. This fact is recognized by practical telegraphers, whether they realize it or not, and is treated by them as such.

And, generally speaking, instruction in telegraphy has proceeded along certain fixed and definite lines ever since the art began to flourish. Of course in the beginning the register was employed until it was discovered that the intelligence transmitted by the telegraph instrument could be read by sound. Ordinarily the student has been given a copy of the telegraph code and instructed to memorize component dots and dashes of the various letters. He is taught how to make the letters with the key and gradually by practice slowly learns how to receive. By this method there are several mental steps required of the student when receiving:

1. The telegraphic equivalent of a letter is heard.
2. This equivalent is analyzed as dots, dashes and spaces.
3. The memorized tables are called to mind.
4. The analytical result associated with the memorized code and the correct letter is selected.

In other words, the student goes through an analytical and synthetic process to determine the letter which is sent by the telegraph instrument. There is nothing particularly wrong with this except that the process becomes habitual and it requires hours and hours of practice before the student learns the letters. The learning of the letters requires the forgetting of the memorized code, substituting therefor the composite sounds which represent the letters themselves. As you yourself well know, the letter "G" over the telegraph is as plain as "G" spoken by word of mouth, and not only this, but the more frequent words become composite sounds which are recognized as such, without any regard whatever to dots and dashes.

It is this fact—that an expert telegrapher does not deal with dots and dashes, but with composite sounds — that lead to the development of the phonetic system.

The baby learns to talk before he knows the alphabet and the modern boy and girl learn to read before they are taught to spell.

By the phonetic system of instruction in telegraphy the student does not learn the code of dots and dashes. He is taught the composite sounds of the letters as they might be made in a message sent at the rate of eighteen to twenty words per minute. For example, five or six letters are selected and sent over and over again until the composite sounds are firmly fixed in the mind. Gradually the other letters, numerals and punctuation marks are added. Long before the entire alphabet has been mastered the students are receiving small words made up of letters, the sounds of which they have already learned. This method continues until the students are able to receive from eighteen to twenty words per minute, at which time they are taught to send. Peculiar as it may seem, many of the students even learn to send to a great extent before they know what the component dots and dashes are. Of course, this is not a part of the system, but it was brought out by the students themselves, who sometimes get hold of the instructor's key and amuse themselves by trying to reproduce sounds which they have heard the instructor make.

By this method a young man of ordinary mental ability is able to become a fairly competent operator in three or four months.

The advantages of this system lay in the fact that the very trying and difficult processes of mental analysis and synthesis are eliminated. The student, not knowing the dots and dashes, hears only the composite sounds of letters or words, which are sent at the rate of speed which he would ordinarily hear them in active service. He either knows or he does not know hence he spends no time in analyzing and placing some particular sound and associating some series of sounds with the code which he has fixed in his memory. If he misses a letter, therefore, he is able to recognize the next succeeding letters, for the reason that he forgets the fact that a letter has been omitted, with the result that he learns to receive very difficult and complicated words.

I believe this is the whole story, except to say that the system has proven successful wherever it has been tried. I recently instructed a class for the Signal Corps, which is now in active service. A portion of these had memorized the code; others had not. After a period of about two months' instruction, at which time the company was taken into the service of the government, those who in the beginning already knew the code were able to receive only five to seven words a minute, while those who followed the phonetic system, and who had never learned the code, were able to receive from fifteen to twenty words per minute.

As you know, our country needs some 25,000 operators for the army. A census which was recently made by the War Department developed the fact that there were at that time approximately 35,000 operators in the United States. A large number of this 35,000 were too old for active service in the army. A certain number were physically unfit; still another portion were married and had dependents, which would render it inadvisable to take them into army service; and another surprisingly large number were women. You can therefore see that it is absolutely necessary to make operators out of brand-new material. This is the work which we are trying to carry out in St. Louis, and I would suggest that you appeal to the telegraph operators of your acquaintance to try in this way to serve their country, even though they are unable to go to the front. I think that you will be delighted with the surprisingly patriotic response to any appeal which you may make in this regard.

In St. Louis, when it was found that we would start a school for the instruction of young men as operators for the Signal Corps, such a large number of present and old-time telegraphers responded that we now have a faculty in St. Louis which could instruct from 1,000 to 1,500 students. Not only this, but from all parts of our country letters were received offering to help out. Unfortunately, we were unable to do anything for those who were outside of the city of St. Louis, for the reason that the work is sufficient here to keep our small organization busy.

Therefore, if you can do anything along this line of training of students for the Signal Corps, you will not only be performnig an exceedingly patriotic service for our country, but you will also be conferring a definite favor upon the young men themselves, for the reason that the Signal Corps is a preferred and very desirable service in the army.

Reminiscences by Nathaniel Hucker of Buffalo.

Mr. Nathaniel Hucker, of Buffalo, N. Y., the well known old-timer and forty-niner of the telegraph, gave an interesting story recently to a Buffalo paper of the growth of the telegraph and of the keen competition between the commercial companies at the time that Jay Gould was active in the management of the Western Union Telegraph Company. He tolled off on his fingers the names of the operators in the offices between Buffalo and Canadian terminals, in cities from Buffalo to St. Louis, and along the lines to the East and the South.

"I came here with my people from Glastonbury, England, in 1843," Mr. Hucker said. "We landed in New York and went up the Hudson by boat. At Albany we took the packet and came to Buffalo on the Erie canal. This seemed to be only a small town, so we went to Detroit by boat. Nearly three years later we returned to Buffalo and settled.

"Then I decided it was time to go to work. I started in at the age of fifteen—that was in 1846—as a messenger boy with the old Buffalo and Canada Junction Telegraph Company, and I've missed only two weeks' work since until I had to retire two years ago.

"In my spare minutes I studied telegraphy with the help of Henry W. Faxon, who was both newspaper man and telegrapher. He worked for the telegraph company then, and later became city editor of the old Buffalo *Republic*. When Faxon quit his job six months later, I received the appointment. I stayed there until 1850, when I went over to the Erie and Michigan Telegraph Company, known as the Speed line.

"I was with the Speed line until the House Printing Telegraph Company took over all rival companies in 1856. The Printing Company did not use the Morse system on its own lines, but continued its use on the newly acquired lines that it did not abandon. At the time of the consolidation, I went over to the House Company. Shortly after there was a reorganization and the House Company was called the Western Union Telegraph Company. The Morse system was restored to all lines, and that gave more work for telegraphers.

"I then was appointed manager of the Buffalo office of the company. In 1861 the duties of chief operator were included in my work. It was at this time that the astounding news of the bombardment and fall of Fort Sumter was flashed over the wires to the North. Our city leaders got busy and volunteers were gathered in mighty short time.

"Another time when I was chief operator that the wires were kept hot, was when the Fenians gathered here in 1866 for their raid upon Canada. When promised help failed to arrive, they had to meet the Canadian soldiers at Ridgeway and face certain defeat. The Fenians that survived came back here and scattered.

"To go on with the story," Mr. Hucker said, "I was manager and chief operator of the Western Union until 1881, when I accepted the management of the Mutual Union Telegraph Company, a strong competitor of the other company. My stay there was brief, for in 1883 Jay Gould bought the Mutual Company for the Western Union, and a consolidation resulted.

"The consolidation didn't help me any, for I had to go back to the Western Union as an operator. I only stayed in that position six months. Then I went to the Associated Press and was assigned to the Buffalo *Commercial*. I held that position for ten years. At the end of that time I accepted the position of traffic chief with the Postal Telegraph-Cable Company.

"After ten years as traffic chief—in 1903—illness prevented me from handling the key any longer, and I was appointed chief clerk for the Postal Company. I continued in this capacity until December, 1915, when I was retired by the company. I would be working today if I was physically able," Mr. Hucker said in conclusion.

Mr. Hucker married Miss Lucretia Harrington, of Batavia, in 1856. They lived happily together until seven years after they celebrated their golden wedding, when Mrs. Hucker died. He has his children left, and is happy with them and his reminiscences of the good old days. Mr. Hucker is now eighty-four years of age.

PROF. MORSE'S FIRST DIVIDEND.—The first money received by Prof. S. F. B. Morse, outside of the government appropriation, was $50 for the right to construct a telegraph line in Washington to the National Observatory. His first dividend was received February 15, 1847, from the New York, Albany and Buffalo Telegraph Company.

THE TELEGRAPH AND TELEPHONE LIFE INSURANCE ASSOCIATION has levied Assessment 627 to meet the claims arising from the deaths of Hattie A. M. Partridge, at Hingham, Mass.; O. B. Vasche, Chicago, Ill.; J. C. Hagerty, Cincinnati, Ohio; H. J. Kerling, Buffalo, N. Y.

Alternating Current Sounder.

The Ghegan alternating current sounder, manufactured by J. H. Bunnell & Co., 32 Park Place, New York, is a distinct advance in telegraph instrument development. Inventors have long worked on the problem of getting up a simple and reliable sounder that would work on alternating current, but it was a baffling task until the advent of the Ghegan instrument.

Alternating current is available almost everywhere and this instrument is easy to install. It can be used on any 110-volt, 60-cycle alternating current lighting circuit, either in series with a lamp or through the secondary of a small, inexpensive transformer.

This sounder will work equally well on direct current without any change in adjustment, so that in places where there is liability of interruption to the alternating current lighting circuit, two dry cells can be switched in to bridge over any such interruptions.

There is no perceptible heating of the coils when the instrument is left on closed circuit continuously, and the humming is not noticeable. In appearance the sounder looks like an ordinary battery, direct current instrument of standard make. It is meeting with much favor in railroad and general telegraph service and the demand for it is constantly growing.

The Stock Ticker.

In the issues of Telegraph and Telephone Age for August 1 and 16 there appeared a story on "The Stock Ticker," prepared by Horace L. Hotchkiss, a former well known banker and broker, a member of the Stock Exchange, and who was prominently identified with telegraph interests in New York in an official capacity for many years. This article has brought forth several letters from old-timers who aided in one way or another in the manufacture or development of stock tickers.

Mr. L. Derrick, of Philadelphia, in a letter referring to the subject, states: "I was in the employ of L. G. Tillotson and Company, New York, where the ticker was made a possibility through the efforts of the late Mr. W. P. Phelps. The earlier experiments had been made at the Singer Sewing Machine factory, at that time on Elizabeth Street, near Spring Street, and it was there that Mr. E. A. Calahan became acquainted with Mr. Kenny. These early experiments in electrical developments would make interesting reading."

Mr. W. H. Sawyer, of Providence, R. I., the now retired insulated wire manufacturer, who was in the late sixties and early seventies identified with the first district telegraph company in New York, has this to say: "I was pleased to see a specimen of writing by Mr. H. L. Hotchkiss, whom I so well remember, both with the Gold and Stock and the American District Telegraph companies. I trust Mr. Hotchkiss will give us something relating to American District affairs of the early days. His article on the Gold and Stock Ticker system was fine. The first unison was devised by Thomas A. Edison, as I mentioned in my article which was published in Telegraph and Telephone Age, July 16, 1910. I well remember Mr. Edward M. Pierson, foreman for L. G. Tillotson and Company; also Patrick Kenny and many others."

The stock ticker in its original form was constructed under the supervision of Mr. Edward M. Pierson, who was superintendent of L. G. Tillotson's shop, while Mr. Kenny was always a loyal and industrious worker for the Gold and Stock Telegraph Company.

In this connection it will be interesting to learn that Mr. H. G. Pierson, of the Foote, Pierson Company, Inc., manufacturers of electrical apparatus, New York, is a son of the late Edward M. Pierson, who came to New York from Cleveland, Ohio, in the early sixties and organized the L. G. Tillotson factory, of which he was superintendent for over thirty years.

While the stock ticker had friends from the very start, it had the usual large number of skeptics who could not see that this innovation in reporting Stock Exchange quotations would ever prove successful, and the few faithful men who favored its development and adoption were well rewarded for their loyalty.

Items of General Interest.

Low Cost Transportation.—So economical are the big ore carriers on the Lakes that they use only a trifle more than half an ounce of coal in carrying a ton of freight a mile.

Length of Day and Night.—By a simple rule the length of the day and night, any time of the year, may be ascertained by simply doubling the time of the sun's rising, which will give the length of the night; and doubling the time of setting, will give the length of the day.

The Conscience Fund.—There is in reality no such distinct account as the "Conscience Fund" in the United States Treasury. Conscience money is immediately turned into the general fund and expended the same as any other receipt. Conscience money sent to the Federal Treasury during the fiscal year of 1913 amounted to $2,814.44. Several hundred people contributed. The identity of all is unknown. The amount makes an aggregate of $434,615.69, thus paid into the Treasury. Conscience contributions range from a few cents to thousands of dollars. The fund was established in President Madison's administration in 1811, when the first contribution of $5 was received. The largest amount ever received in one year was $35,868, in 1902, and the greatest individual contribution was $18,669.60, was made to the Collector of Customs in New York, more than a decade ago.

Mr. John F. Richardson, formerly superintendent of the Canadian Pacific Railway Company's Telegraph at Montreal, now living in retirement at Lanigan, Sask., in remitting to cover his subscription for another year, writes: "I was a contributor to your publication in 1883 and have been a constant reader ever since. I congratulate you on this thirty-fifth anniversary. Although retired from active service, I like to keep in touch with telegraph and telephone advancement; also with my old associates. I sincerely wish you every success."

Electrolysis.

(Continued from page 420, September 16)

INFLUENCE OF FACTORS IN ELECTRIC RAILWAY OPERATION.

GENERAL. It was stated in the preceding instalment that current would tend to leave the rails whenever there is a considerable drop in potential in them. It was also pointed out that the reduction of this leakage current would be effective in mitigating electrolysis of neighboring cable systems. It therefore follows that the person responsible for electrolysis maintenance must be sufficiently familiar with electric railway systems to enable him to detect conditions especially conducive to electrolysis and to suggest modifications of the railway system that will help solve the electrolysis problems. The following paragraphs are intended to give a brief outline of the more important of these factors.

TRACK INSULATION. If the railway return circuit were entirely insulated from earth there would be no leakage currents to cause electrolysis. Such systems, however, are not in general use, due principally to the expense and operating difficulties involved. In a few cities, notably New York City, Washington, D. C., and Cincinnati, Ohio, there are railway installations in which the running rails carry no current, there being a double overhead trolley with both positive and negative conductors insulated. These installations are effective from an electrolysis standpoint, but it is not likely that many similar systems will be installed in the future.

For the most part, whatever insulation is given, the return circuit must be that which is afforded by the wooden ties and track ballast. This insulation is quite considerable in the case of elevated structures and subways in which the tracks are protected from the weather, but is much less in the ordinary construction, especially when the rails are more or less buried in the earth.

From the standpoint of the telegraph company, it is not practicable to overcome existing electrolysis conditions by increasing track insulation, as such measures involve more expense than can usually be justified. Equally good protection can be more cheaply obtained by other means.

BONDS AND CROSS BONDS. Since the amount of leakage current depends to a large extent on the conductivity of the rail return, one of the prime requisites for electrolysis mitigation is proper maintenance of the track. A high resistance rail joint or broken bond may force a large current into the earth and seriously endanger neighboring systems which are otherwise safe from corrosion. In electrolysis surveys, therefore, it is often found necessary to test out the continuity of a track return and, in case of excessive voltage drop, to locate the immediate cause. In general, the resistance of a well maintained rail joint should not greatly exceed that of six feet of rail.

One of the best precautions against troubles from defective joints is to cross bond the rails. If such bonds are placed at frequent enough intervals and well maintained they will largely eliminate the serious effects of "occasional" bad joints, although they naturally will not offset generally poor condition of the rail bonds.

UNINSULATED NEGATIVE FEEDERS. In Fig. 3 is shown a typical form of what is known as an "uninsulated" negative feeder system. This system consists of track whose conductivity is reinforced by conductors run parallel with and connected to the rails at the ends, and usually also at intermediate points. Both track and feeders are directly connected to the negative bus at the power house. The conductors are usually (although not always) insulated from the earth by carrying them overhead on poles or underground in conduit, but the system as a whole is considered "uninsulated" because the station bus is grounded. As a matter of fact, many systems have a special ground plate installed at the station to decrease the resistance of the negative return circuit.

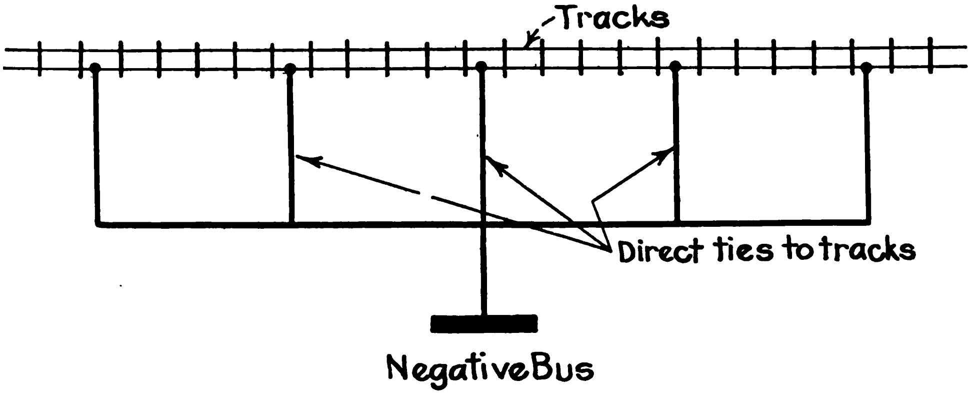


FIG. 3—UNINSULATED NEGATIVE FEEDER SYSTEM.

One of the principal purposes of a return system like that just described is to reinforce the track conductivity so as to reduce the potential drop in the rails. Hence it reduces the amount of stray current and, in consequence, lessens the danger of electrolysis in neighboring cable systems.

In a system of feeders such as just illustrated the potential of the rail varies from point to point somewhat as shown in Fig. 4. The tracks at the power house are at the lowest potential, while the highest potential occurs at the more distant points. The greatest variations in track potential—that is, the highest potential gradients—are found in the vicinity of the power house.

Of course, the practical application of uninsulated feeders to actual railway systems results in considerable modification of the simple scheme described, but all uninsulated systems have the characteristic low track potential near the power stations and high potential farther away. Neighboring cable and pipe systems, therefore, tend to pick up current in the outlying districts and to deliver it back to the tracks in the vicinity of the power station. The latter vicinity forms the "danger section," and here, where the potential drops in the tracks are greatest, is where the electrolysis of cable systems must be most carefully guarded against.

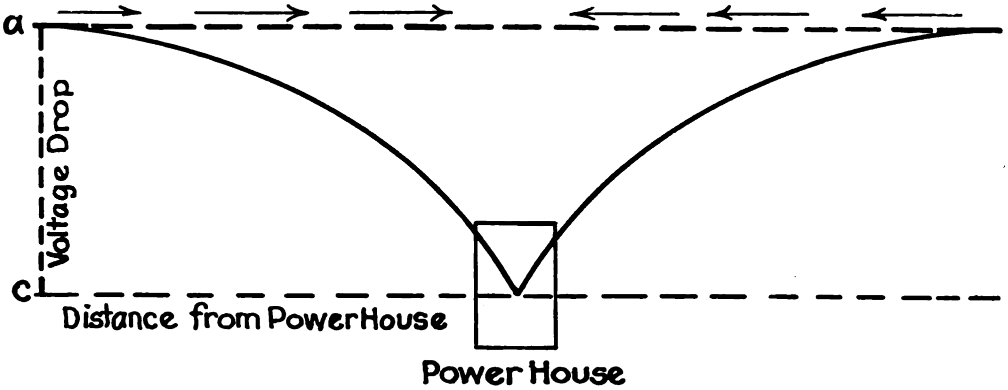


FIG. 4—POTENTIAL GRADIENTS IN RAILS WITH UNINSULATED NEGATIVE FEEDERS.

Insulated Negative Feeders. Although it has been stated that a reduction of track drop is essential to the reduction of stray current, the condition to be attained is not so much the lowest possible resistance in the negative return as it is the minimum difference in potential between different parts of the track network. What is known as the "insulated" negative feeder system is the most efficient scheme for securing these minimum potential differences that has yet been applied to railway systems which use the track as a part of the negative return. When properly laid out and installed, such a system will so reduce differences in track potential that the dangers from electrolysis will be greatly lessened. The system, furthermore, has the advantage of requiring much less copper in the negative feeders than would be required for a considerably less efficient "uninsulated" system. The particular characteristics of the "insulated" return feeder system are as follows:

(a) The negative bus is "insulated" from the rails near the station, or at least not directly connected to them.

(b) The connection between the negative bus and rails consists of several feeders connected to the rails at different points throughout the track system, and so proportioned as to size and resistance that the potential drop in each will be approximately the same.

Fig. 5 shows a typical form of the insulated negative feeder system. With this arrangement the current is removed from the tracks at several points and all feeder connection points are at or near the same potential. If the tracks near the station are connected to the negative bus, a suitable resistance is inserted so that the track at this point will be at the same potential as the other feeder connection points. Another form of the system is shown in Fig. 6.

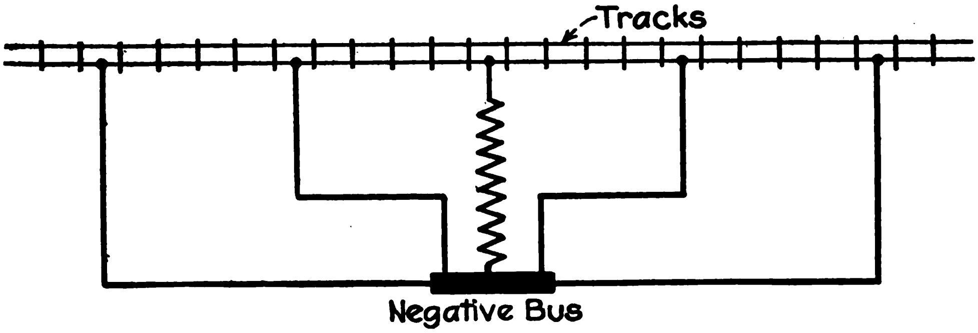


FIG. 5—INSULATED NEGATIVE FEEDER SYSTEM.

The variation of potential in the rails and the potential between the rails and negative bus is graphically shown in Fig. 7. By comparing this with Fig. 4 it will be noted that there is no steep potential gradient in tracks of an "insulated" return feeder system, as there is in an "uninsulated" system, and no one point of extremely low track potential. Although there may be as great or a greater difference in potential between the tracks and negative bus, the maximum potential difference in the tracks is only that represented by *ab*, the remainder of the drop, *bc*, taking place in the feeders. In an uninsulated system the entire drop *ac* takes place in the tracks.

As is to be expected, many variable factors make it impracticable to attain the full theoretical efficiency in practical applications. In fact, it is sometimes found desirable not to attempt to obtain equal potential drops in all feeders, but to obtain a condition somewhat intermediate between those illustrated in Figs. 4 and 7. In any event, the actual installations of insulated negative feeders that have been made have demonstrated that this system is one of the most reasonable and effective methods of reducing track drops and mitigating electrolysis.

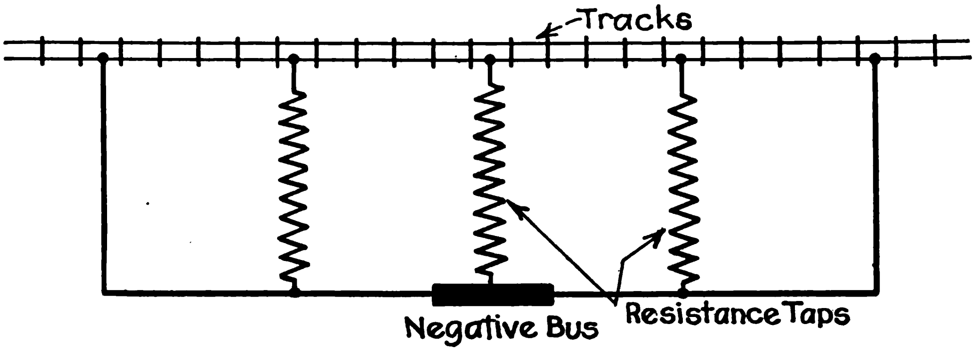


FIG. 6—INSULATED NEGATIVE FEEDER SYSTEM WITH RESISTANCE TAPS TO RAILS.

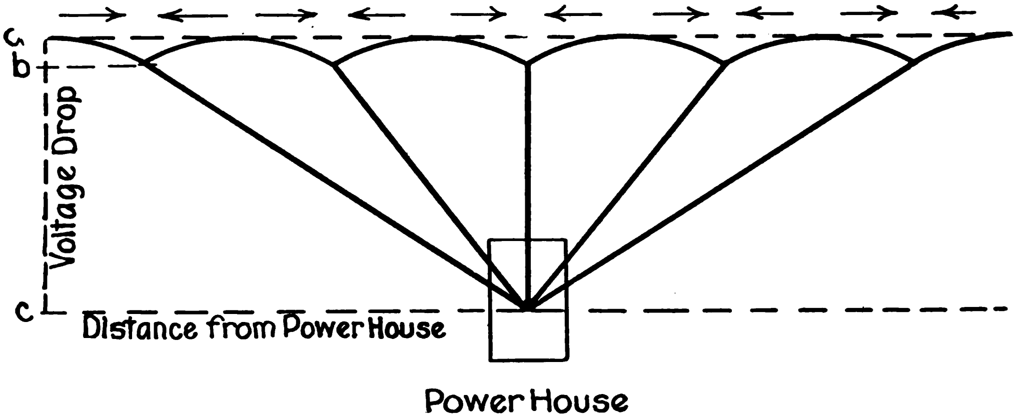


FIG. 7—POTENTIAL GRADIENTS IN RAILS WITH INSULATED NEGATIVE FEEDERS.

Reorganizing Signal Corps.

The plans for the reorganization of the Signal Corps of the United States Army, made necessary by the new law which appropriated $640,000,000 for air and signal service, have been completed and approved by Brigadier-General George O. Squier, chief signal officer of the army. The new officers will include two of general rank, one to command air operations and the other to act as chief of land activities. Under the new reorganization plans Major John J. Carty, chief engineer of the American Telephone and Telegraph Company, will become a colonel in the signal service. Captains J. C. Mauborgne, E. R. Andrews and L. R. Krum, now in the radio development service, will become majors.

Scrubbing by Electricity.

The applications of electricity for relieving both man and woman of tedious work and drudgery are gradually being extended. One of the most irksome duties connected with the keeping tidy of large buildings and institutions is the scrubbing of floors. Not only is this a laborious and disagreeable task, but it takes a great deal of time to go over a large surface of flooring with scrub brush or even with a mop.

The solution of this problem is the electrically driven floor scrubbing machine. A device of this character has been tried out and found very satisfactory. The machine wets, sweeps, scrubs and dries the floor at a single operation.

Life of Poles.

A cedar pole, whose average life is about fifteen years, requires from 100 to 200 years to grow. The average thirty-foot cedar pole is 140 years old when cut. This means that in order to maintain the present supply there should be ten trees growing for every pole in use, or 400,000,000 for renewal only. With our characteristic American backsight, unbounded faith in our almost inexhaustible resources, and our firm belief that "the Lord will provide," we have overlooked this small point until the present depletion of the forests presents a problem worthy of the careful consideration of any cub engineer. To overcome this difficulty, various kinds of poles have been suggested and used, such as iron, concrete, glass, paper and other materials, but up to the present no type has been developed which has proved to be more economical than wood poles, even though the price of the latter has advanced about 150 per cent. in the past ten or fifteen years.—E. R. Hannibal in *Mountain States Monitor.*

Efficiency Engineering in the Telegraph Service.

(Continued from page 426, September 16)

Every man should have an object in life. Hold your head up and your back straight, choose your direction, go forward and you will win. The world is half filled with drifters, one authority tells us, and these drifters go aimlessly along through life never reaching anywhere that spells Success. The drifting man has hands in pocket, hat pulled down in front, aimlessly wandering.

But drifters are not all of this type. You may find them well dressed, pockets lined with inherited money, wondering what they can do that would be worth while.

You may find them going through some routine of work, quite satisfactorily, but, as they work, drifting through life. They have no plan, no thought as to how to make their work better, how to make life worth while.

What makes the power and success of an army? Fixed purpose.

To a weak, vacillating general you may give soldiers, but he will bring you no victory.

To an officer of strong will and good brain you give a small army, and he returns victorious. Alexander the Great took his thirty thousand Greeks against half a million Persians, and went through them like a sharp knife through a piece of cheese.

He knew exactly what he was after—conquest of the world in the end, and the conquest of Persia at that particular time.

He went on, never stopping, conquering until he died.

Any young man would be horrified if told that the President were sending an army to Europe without any particular plan as to what the army was to do, where it was to go, how it was to strike.

Well, young man, what the directing or leading general is to the army your will power should be to you.

An individual is a small army of hopes, possibilities, ambitions, locked up in one body. The strength is in him, if he will use it.

But if there is no general living in his skull, no directing force, he wanders, destination unknown. And when he goes into the waste basket of failure he whines "I never had any luck."

What he should say is, "I never had any pluck." It is the man who supplies the "p" to "luck" that arrives.

A young man starts his business career when leaving school as a messenger boy in a telegraph office where he is told he will have the opportunity of acquiring a knowledge of telegraphy. A trade is open before him. He is ambitious. Within twelve months he has qualified as an operator. His spare moments only were devoted to study. Whenever he had the opportunity, he could be seen copying from a through wire. In the course of time the chief operator noted the fact that he was able to receive everything that passed over the circuit.

The superintendent of telegraph of a nearby railroad called at the office one day and asked the chief operator if he had any young operators he could recommend to him to fill positions at small stations. The messenger was selected. His first telegraph position was therefore in a railroad office where the telegraph duties were light. To make life worth while he had to sell tickets, check baggage, handle the mail to and from the trains, attend to the freight and, in brief, attend to every duty that the railroad company was called upon to perform at this way station. Whatever he did was done right. His reports to headquarters were neat and always to the point. He made his aim in life noticeable to everyone who had to deal with his station. In time he had attracted the attention of his superior officials. They realized that he was capable of occupying a more important position and he was advanced. The bonding companies had no hesitation in endorsing him as A No. 1. His directness of purpose and his aim in life to succeed had even favorably impressed the officials of the bonding company. His advancement from a larger to a more important station followed in quick succession with the result that when he had reached the age of twenty-five years he was advanced from the position of chief train dispatcher to that of trainmaster. Today he is the president of the railroad. His life has been a success from start to finish.

Another messenger, a companion of the one previously mentioned, had the same opportunities. He had been urged by the local telegraph officials to utilize his spare moments to fit himself for a higher position in the clerical or the operating department. He neglected the opportunities afforded him. He endeavored to persuade the manager to permit the messenger boys during dull periods to play cards. The manager objected because a habit of this kind had no tangible value to it. The messenger grew up to manhood always with the same excuse, "What is the use?" when asked why he did not devote his spare time to making his services more valuable to his employing interest. This man never got anywhere. He lacked an aim in life. He had no plans; he drifted with the tide and got nowhere.

The time wasted by each individual if partly devoted to bettering one's condition would, in the course of a few years, produce marvelous results. Aims in life will largely prevent a person from violating the moral and civil laws. They remove the temptations that beset individuals. They make a man strong; they make him master of himself; and that is the very best inheritance any one can possess.

(To be continued)

NATIONAL FIRE PROTECTION ASSOCIATION.—The adjourned meeting of the Electrical Committee of the National Fire Protection Association will be held on Tuesday and Wednesday, October 23 and 24, at the rooms of the New York Board of Fire Underwriters, 123 William Street, New York City. Mr. Ralph Sweetland, Boston, Mass., is secretary of the Electrical Committee.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

CURRENT IN DIVIDED CIRCUITS.

With ten wires of the same resistance connected to the same battery, the strength of current furnished each wire when all are closed will be not quite .03 ampere, or about one-third of that which would be furnished any one of the ten wires with all the others open. Assuming that a strength of current of .03 ampere might be sufficient to operate the relays, it would be impracticable to keep them adjusted for this range of change of current strength.

With, however, a battery of the same electromotive force, but having a total internal resistance of only one ohm, it will make little difference, so far as the strength of current supplied each wire is concerned, whether one or all of the ten wires connected to it be open or closed.

For instance, again assuming each wire to have a resistance of 1,000 ohms. With but one wire closed the total resistance of the circuit, including internal resistance of battery, will be 1,001 ohms. The strength of current in the circuit will be, consequently $\frac{100}{1,001} = .099$ ampere. With the ten wires closed their joint resistance will be 100 ohms. Adding the battery internal resistance, we get a total of 101 ohms, which gives $\frac{100}{101} = .99$ ampere. This, distributed equally, gives to each of the ten wires .099 ampere, as was the case with but one wire closed. If the decimals be carried out further it will be found that each wire gets slightly less current when all are closed than any one would get with the other nine open, but practically the amount is the same.

With a battery of still less internal resistance a much larger number of wires could be fed without any perceptible change in the strength of current on any of the external circuits, regardless of the operation of the other circuits.

(To be continued)

Telephony.

THE TELEPHONE REPEATING COIL AND ITS OPERATION.

There are many types of repeating coils and they have a great many different uses, but the most common and widely used type is the one through which practically every telephone conversation on the common battery system of the Bell companies is transmitted—the battery supply coil. These coils are mounted on racks and each is connected to the two plugs which the operator inserts in the jacks on the switchboard connecting the calling subscriber's line to the line of the subscriber called.

A repeating coil is practically a double induction coil. Each coil consists of an iron core and primary and secondary copper windings. The core is ring shaped, and is built up of a large number of turns of small soft iron wire. The iron wire core is covered with a wrapping of cotton tape over which are wound the copper windings. The primary and secondary windings are each composed of two sections, one section on each half of the core, the sections of the secondary being wound over the primary.

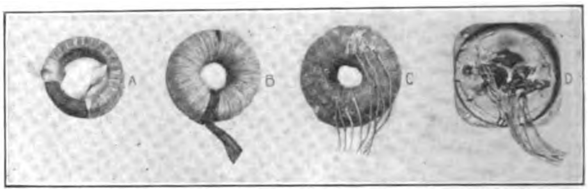


FIG. 1—STAGES IN THE MANUFACTURE OF A REPEATING COIL.
A, Iron Core Wrapped with Tape; B, Primary and Secondary Windings in Place; C, Coil Taped and Waterproofed; D, Coil in Position, impregnated with rosin.

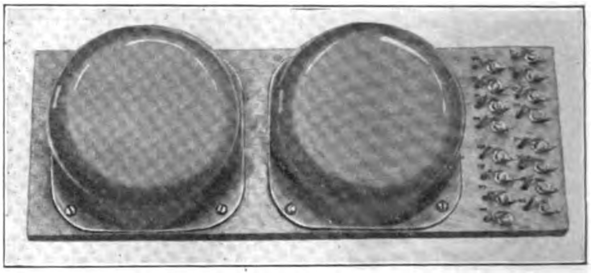


FIG. 2—TWO FINISHED AND MOUNTED COILS CONNECTED TO TERMINALS.

Each section consists of hundreds of turns of small insulated copper magnet wire, the number of turns in each being the same. The coil is then given another wrapping of cotton tape, after which it is impregnated with a moisture-proof compound. It is then placed in an iron case and the case filled with melted rosin, after which it is mounted on a wooden base and the ends of the several sections of primary and secondary windings connected to their properly numbered terminal clips. The different stages in the coil assembly are shown in the illustrations.

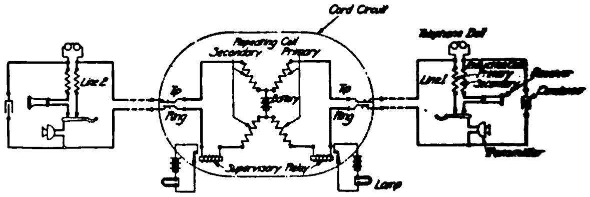


FIG. 3—METHOD OF CONNECTING REPEATING COIL IN CIRCUIT.

One of the principal uses of this type of repeating coil is to permit the introduction of the continuous current from the central office battery into the telephone line without producing an appreciable loss in the alternating speech current which is generated in the telephone transmitter by the vibrations of its diaphragm. This method of connecting the repeating coil in the circuit is shown in Fig. 1. The battery current flows out on either line through the repeating coil windings and the operator's supervisory signal relay at the central office and energizes both of the subscriber's transmitters.

If the battery should be connected between the lines without the repeating coil, a very small percentage of the generated speech current from one line would pass to the other. Nearly all of it would pass through the battery and back to the transmitter, as the battery would offer a far easier path for the speech current than would the other line.

(To be continued)

QUESTIONS IN TELEPHONY.

What is the "booster" effect produced by the condenser in the common battery subscriber's set?

What parts of the set are connected directly to the line?

What parts of the set is the secondary of the induction coil connected with?

How is the talking current of a telephone produced?

State for what other purposes condensers are used in connection with telephone operation?

Radio Telegraphy.

TRANSMITTING CONDENSERS.

The functions of the condenser are, by virtue of its capacity, to store the charge delivered to it by the transformer secondary circuit until its potential reaches the desired value as determined by the spark gap, and then to discharge through the gap and the inductance. An ideal condenser would be one that was perfectly insulating, could not be punctured, and showed no heating or losses of any kind during charging and oscillatory discharging.

There are several different types of transmitting condensers in the Signal Corps radio stations, varying widely in capacity, size, voltage, etc., from the small mica ones of the field radio sets to the 4½-foot jars or compressed-air types in the permanent stations. All types consist essentially of two conducting surfaces, as tin or copper foil separated by an insulator or dielectric (as it is often called) which can withstand without puncturing the high voltage required to break down the spark gap. Probably the most efficient condenser is the compressed-air type, which consists of a large number of circular metal plates mounted on two sets of supports with a small air space between the plates, the top plate and every alternate plate being connected together as one set and the remaining plates as the other set. The whole is contained in an air-tight tank, one set of plates being connected to the tank as one terminal and the other set to a terminal brought out through the cover in a porcelain insulator sealed air-tight by a lead gasket. Air is then pumped into the tank until a pressure of about 240 pounds per square inch is reached, or about sixteen atmospheres of fifteen pounds per square inch, as shown by a pressure gauge on top of the tank. At this pressure it has been found that air has an insulating strength many times greater than at ordinary pressures. Condensers of this type will withstand a maximum or "peak" voltage of about 20,000 volts under service conditions. The most serious objection is the excessive weight, a tank of about 0.006-microfarad capacity weighing about 300 pounds.

(To be continued)

The Western Union Multiplex.

In the case of the quadruple duplex, triple duplex, double duplex, and two-way services, the messages are first prepared on tape by an operator using a keyboard perforator, as shown in Fig. 1. For each key of the perforator depressed, a number of holes are punched in the tape, and their arrangement determines the combination of positive and negative currents which will be sent to line when the tape is fed through a transmitter (Fig. 2) working in conjunction with a distributor (Fig. 3).

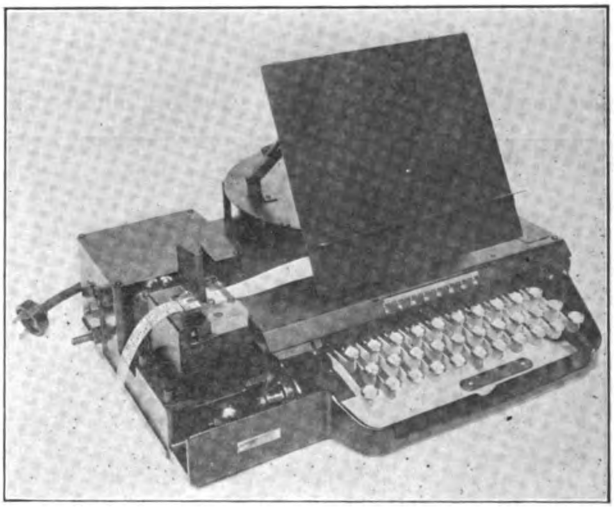


FIG. 1—KEYBOARD PERFORATOR.

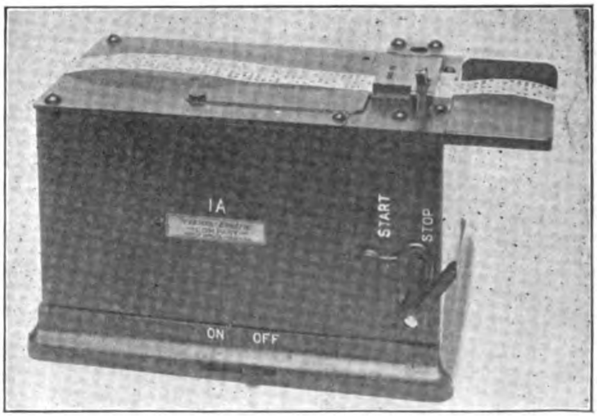


FIG. 2—TRANSMITTER.

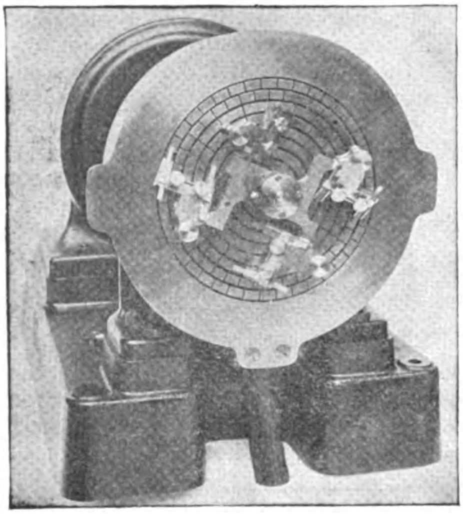


FIG. 3—DISTRIBUTOR.

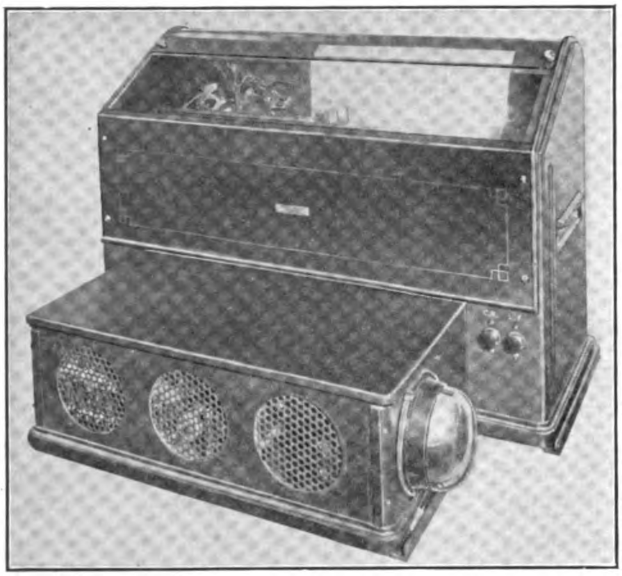
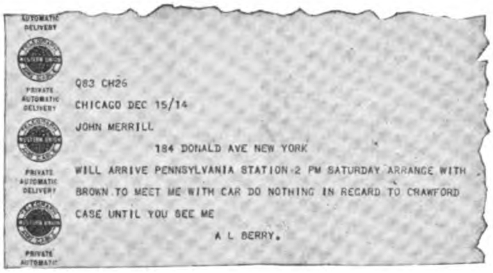


FIG. 4—RECEIVING PRINTER.



AUTOMATIC DELIVERY
PRIVATE AUTOMATIC DELIVERY
PRIVATE AUTOMATIC DELIVERY
PRIVATE AUTOMATIC

Q83 CH26
CHICAGO DEC 15/14
JOHN MERRILL
184 DONALD AVE NEW YORK
WILL ARRIVE PENNSYLVANIA STATION 2 PM SATURDAY ARRANGE WITH
BROWN TO MEET ME WITH CAR DO NOTHING IN REGARD TO CRAWFORD
CASE UNTIL YOU SEE ME
A L BERRY.

FIG. 5—PRINTED MESSAGE AS RECEIVED.

The impulses thus transmitted over the line operate a polarized line relay at the receiving station which, in conjunction with another distributor, passes the impulses along to a receiving printer (Fig. 4), which translates them into the predetermined letter or figure, and prints them in page form (see Fig. 5), so that when a message is completed, it may be torn off and is ready for delivery. If so desired, the message may also be received in the form of a perforated tape. This is accomplished by means of a reperforator which works in conjunction with the printer. The tape thus prepared may be used for retransmission on another line operated by any of the described methods of operation.

Shop Talk.

BY THE OBSERVER.

We often hear the expression: "The ethics of the profession," therefore there can be no harm in discussing the ethics of the repeater chief's domain. Before the institution of the dispatcher, it was customary to look upon New York, Chicago, St. Louis, etc., as the spokesmen. In other words, when any of those large offices gave an order, the smaller offices accepted it as official and the same was properly obeyed, or somebody "got bawled out."

Now, even to this day, there is a tendency at times for some one to act as a "bawler." Stop it! Wherever there is a repeater chief who does not come up to requirements, handle the case in the proper way. I have seen and heard of cases where a very gifted repeater chief who is ever alert, willing, etc., becoming engulfed in an unusual amount of trouble, being bawled out because he did not respond instantly. Knowing what the man was up against I have often wished that I could see the "bawler" put to a test where he was "swamped," and watch him in action. It is no more work to do things politely than it is to do them in a wrangle. In fact, I know it is easier when there is no passionate upheaval; therefore, do not, either by message or in talk, show an unfriendly spirit. Very often two repeater chiefs will get into a row as to whose set is the faulty one. Many records of the needle swing, etc., etc., will be passed. If there is any spare set available and you are asked to swap, then swap. If your former set is O. K., it is certain the trouble will be proven at the other end and you are twice the victor because you did not stop to "scrap." If at any time all your sets are in use and the other end will not change, but insists that you must, then take a set out of the circuit you can stop for a few moments and make the change. You can then tell him that you swapped, and your other set is O. K. Too many repeater chiefs seem to feel belittled because someone would dare say their set was bad, and fly off at a tangent, ripsnorting, fuming, etc. After it was all over, did not you feel ashamed? Of course you did.

Another thing that there is sometimes a row about is a case of "exaggerated ego," or too firm a belief in the fact that you are never wrong. Remember, the man who never makes a mistake never makes anything. The point is: try and not repeat the same mistake, but never get despondent. Fight yourself whenever you would start a "scrap" on the wire, but do not fight the other fellow.

(To be continued)

FOR CLEAR
TRANSMISSION

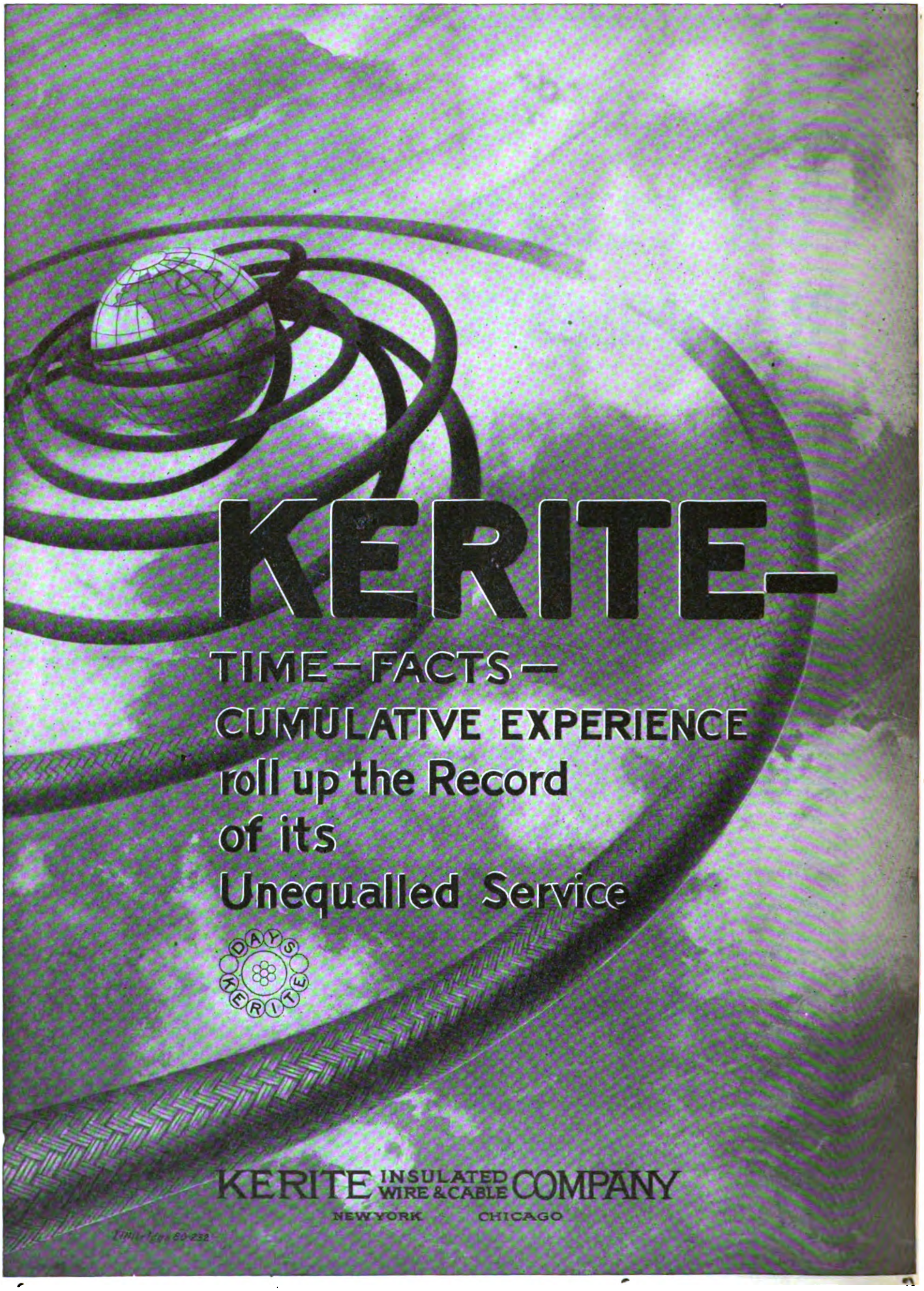
EDISON PRIMARY BATTERY DIVISION
THOMAS A. EDISON, Inc.
30 Church St., New York, N. Y.

HALL SWITCH AND SIGNAL CO.
New York Chicago

MANUFACTURERS OF THE

GILL SELECTOR

THE UNIVERSAL SELECTOR
FOR TELEGRAPH AND TELEPHONE


KERITE–
TIME–FACTS–
CUMULATIVE EXPERIENCE
roll up the Record
of its
Unequalled Service
DAYS KERITE
KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK
CHICAGO

THE RAILROAD.

Special Meeting of Railway Telegraph Superintendents.

As already announced, the annual convention of the Association of Railway Telegraph Superintendents, which was to have been held at Washington, D. C., September 18, will be substituted by a special meeting of the association of one or two days' duration in Chicago some time in November, the dates having not yet been appointed. This meeting will be a strictly business session, and there will be no special entertainment to lure the members from their work.

The cancellation of the regular convention, however, will not affect the interim work, and the committees will continue their labors and be prepared to report to the special meeting in November, just as they would to the full convention, had it been held at the originally appointed time.

MUNICIPAL ELECTRICIANS.

Paterson's Police Telegraph.—The new police telegraph system recently installed at Police Headquarters in Paterson, N. J., has been inspected and accepted. It is said to be one of the finest in the country, and was installed by the Gamewell Fire Alarm Telegraph Company. Mr. James F. Zeluff is superintendent of fire and police telegraphs.

Portable Electric Fire Detector.

A new electric fire detector is a thermometer constructed of a steel tube for a mercury receptacle, to which is attached the lower contact screw, also the regulating screw by which the detector is set to any given degree from zero up to as high as conditions require. A fiber tube carries the upper contact screw. The detector will not give a false alarm when properly set, it is claimed. This outfit is for use in kitchens or other such localities.

The possibilities of this detector are unlimited, giving a positive alarm of fire at the opportune time; the absolute automatic control and closing of fire-doors and shutters; the announcement of rising temperatures in refrigeration plants, and the absolute control of open-head sprinkler systems.

The detector gives an alarm long before the automatic sprinkler will operate; thus not only preventing fire loss, but eliminating the water damage to a very large degree. For warehouses and holds of ships where cotton is stored, an alarm is given when the cotton first begins to smoulder.

The detectors for protection in hotels, theaters, homes, apartment houses, office buildings and buildings of like character are set to operate at, say, 110 degrees. They can be set to show a rise of a fraction of a degree.

Each detector will, under ordinary conditions, cover an area of 250 square feet of floor space. In a room, say, twelve by fifteen feet, one detector would be sufficient, but if fastened to side walls two would be required.

OBITUARY.

G. L. Foote, aged seventy-four years, a well known inventor of telegraph appliances, and formerly president of Foote, Pierson and Company, manufacturers of electrical apparatus, New York, died at his home in Brooklyn, N. Y., September 24. He was a Mason of high degree.

Daniel L. Russell, a well known New York telegrapher, prominent in labor circles, died suddenly of heart disease, September 24. He had worked for both telegraph companies, as well as in broker offices in New York City, but for some time past he had been doing newspaper work.

James F. O'Reilly, a former operator of Worcester, Mass., died at a hospital in France, August 13, from wounds received at the front. He enlisted in a Canadian regiment at the beginning of the war. He worked for the Western Union Company in Worcester and later in Toronto, Ont., where he married.

INDUSTRIAL.

Wires and Cables.—The General Electric Company, Schenectady, N. Y., is distributing a loose leaf binder containing five of its latest bulletins on wires and cables, as follows: Armored cables; wires and cables—general; varnished cambric and paper insulated cables; conductors insulated with vulcanized rubber compounds; splicing materials and junction boxes.

The J-C Repeater.

One of the simplest and most easily operated and maintained repeaters is the J-C repeater, made by the Jester-Cooper Company, Houston, Tex. This instrument is steadily growing in favor in telegraph and railroad offices, as it eliminates the annoyances attending the use of batteries. No local batteries are required for its operation, the repeater being of the direct-point type. It is easily kept in adjustment, and in every way it gives the utmost satisfaction. It is used by the War Department and on many of the principal railroads. Any one interested can obtain a descriptive bulletin by addressing the company.

Strike of Portuguese Operators.—A strike occurred among the employes of the telegraph service between Portugal and France on September 1. The strikers returned to work on September 16.

"REMCO"
ALTERNATING CURRENT SELECTORS
(Controlling Patents)
Tested and Proved
Manufactured only by the
RAILWAY ELECTRIC MANUFACTURING CO.
250-252 West Water Street
MILWAUKEE, WIS.

Convention of the International Association of Municipal Electricians.

The twenty-second annual convention of the International Association of Municipal Electricians was held at Niagara Falls, N. Y., September 11, 12, 13 and 14, with a large attendance. The meetings were held in the Cataract House, but the headquarters of the Association were at the International Hotel. On the wall back of the platform was hung the American flag, flanked by the British and French colors.

Hon. George W. Whitehead, mayor of Niagara Falls, opened the convention with an address of welcome, which was responded to by Mr. C. E. Diehl, of Harrisburg, Pa.

Ex-President W. H. Flandreau read the address of President R. J. Gaskill, who was absent on account of having joined the colors. The address was written in a patriotic spirit. Mr. Gaskill referred to a resolution of the executive committee. passed last spring and addressed to the President of the United States, pledging the support and cooperation of the Association in the national crisis. "There is no doubt in my mind," said Mr. Gaskill, "that we, as a national association, can be of immense benefit to our country."

Mr. C. E. Convers, second vice-president of the Association, then assumed the chair and conducted the meetings throughout.

In a paper on "The Renewable Type of Enclosed Fuse," Mr. A. L. Eustice, of Chicago, traced the development of this device, which, he said, has been a standard article of manufacture for over six years.

Mr. C. E. Corrigan, vice-president of the National Metal Molding Company, Pittsburgh, Pa., presented a paper on "Metal Molding," in which he said that the trend of modern construction is constantly toward a metal basis, especially in new office and similar buildings. The installing of electrical wiring in at least business districts of cities in metallic protection—either rigid conduit, armored conductors or metal molding—conforms to this modern construction tendency, and gives the needed and desirable mechanical, chemical and atmospherical protection to the enclosed wires.

At the afternoon session a lengthy discussion of Mr. Eustice's paper on renewable fuses took place. Mr. Clarence R. George said the time would come when all fuses would be of the renewable enclosed type. The fuse question is a difficult one, he said. "Economy is what the people want and they are going to have it."

The paper was referred to the Standardization Committee and to the Bureau of Standards.

"Public Lighting" was the subject of the next paper, by Frank J. Dix, manager and general superintendent, Municipal Electric Light and Power Works, Fort Wayne, Ind.

Mr. Dix discussed arc lamps, cluster posts, boulevard lighting, alley lighting, the series nitrogen lamp, city duty, cost of lighting, and remote control, which latter subject, he said, had proven to be a very knotty problem, especially since the new kinds of Mazda lamps have come on the market.

At Wednesday's session the first paper read was one by E. E. Salisbury, of the police signal department of the Gamewell Fire Alarm Telegraph Company, New York, entitled "Police Signaling Systems as Affecting Municipal Electricians."

Without doubt, he said, an efficient and properly regulated police department is the best fire insurance on earth, due to the indisputable fact that where a police department is running to a maximum efficiency it is invariably those patrolmen or moving city watchmen who first discover and report to fire headquarters a large percentage of all fires occurring within a municipality, especially during the night period, when nearly all disastrous fires are started. This emphasizes the importance of having an adequate police telegraph signaling system for properly regulating and directing the movements of patrolmen. Without it no police chief can possibly bring his department to that degree of patrol and watchful efficiency which guarantees to the people the complete fire as well as police protection they would otherwise receive, and to which they would be entitled provided the municipality would see to it that its police department was furnished with proper intercommunicating and signaling facilities.

C. E. DIEHL, THE NEW PRESIDENT.

As to means for summoning patrolmen to the nearest street box or telephone, or to the office, to receive instructions, it is plainly apparent, he continued, that a system which furnishes provisions for accomplishing the desired end in such a way as to leave the patrolmen free to render the fullest possible patrol service is the most desirable. It seems obvious, therefore, that provision for signaling by audible means as well as by visible means is very essential.

In discussing Mr. Salisbury's paper, Mr. A. C. Farrand, of Atlantic City, said he thought bells and horns should be used to give alarms.

Mr. J. B. Yeakle, of Baltimore, thought that the less noise that was made the better.

Mr. G. F. C. Bauer, of Buffalo, said that in his city as little noise was made as possible, and that only in the districts where it was needed.

At the afternoon session Mr. G. F. C. Bauer, of Buffalo, read a paper on "Buffalo's New Police

(*Continued on page 453*)

The Gamewell Fire Alarm Telegraph Company

Newton Upper Falls, Mass.

WM. GELLATLY, Pres.
V. C. STANLEY, Vice-Pres.-Secy.

September 16, 1917

To the Fire and Police Alarm Superintendents,
United States and Canada.

Gentlemen:

The Fire and Police Signal Systems so nearly perfected by this Company during the past sixty years have reached their present development through constant coöperation between our engineers and inventors, and the men in charge of the daily operation of these most important public utilities. In our constant effort to reach ultimate perfection in details, and to extend the functions and uses of Municipal Signal systems, we request and welcome suggestions and information based on the experience of City Electricians.

We are at all times prepared to furnish you with printed matter, details and estimates to assist you in obtaining appropriations for needed improvements and extensions of your equipments.

Correspondence with City Electricians on subjects of mutual interest is cordially invited.

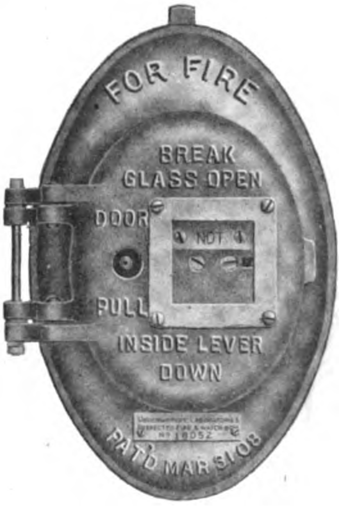
Very truly yours,
THE GAMEWELL FIRE ALARM TELEGRAPH COMPANY.

AGENCIES

70 East 45th Street, New York City
200 Devonshire Street, Boston, Mass.
564 Monadnock Block, Chicago, Ill.
1006 Aronson Bldg., San Francisco, Cal.
1410 Keenan Bldg., Pittsburgh, Pa.
304 Jacobson Bldg., Denver, Colo.
Peters Bldg., Atlanta, Ga.
816 Praetorian Bldg., Dallas, Texas
General Fire Appliances Co., Ltd., Johannesburg, South Africa
Northern Electric Co., Ltd., Montreal, Can.
Nissl & Company, Vienna, Austria
Western Electric Italiana, Milan, Italy
United Incandescent Lamp & Electric Co., Uj-Pest, Hungary
Nippon Electric Co., Ltd., Tokio, Japan
N. C. Heisler Electro Mechanical & Telephone Works Co., Petrograd, Russia
Western Electric Co., Buenos Aires, Argentine, South America

THE STANDARD IN PROTECTION

SMALL
IN
SIZE



MIGHTY
IN
SERVICE

COMBINED
SUPERVISION OF WATCHMEN
AND
FIRE ALARM SERVICE

SUPERVISION OF
SPRINKLER SYSTEMS

AUTOMATIC
FIRE ALARM SYSTEMS

PROTECTIVE SERVICES

CONTROLLED COMPANIES
OF
AMERICAN DISTRICT TELEGRAPH CO.
195 BROADWAY
NEW YORK, N. Y.

CENTRAL OFFICES IN ALL PRINCIPAL CITIES

A.D.T.
PREPAREDNESS
SYSTEM

(*Continued from page 450*)

Signal System." The highest efficiency in police service, he said, can only be obtained through the use of some means whereby the station house can communicate without delay with the men doing patrol duty on the streets.

After referring to the development and the shortcomings of the present systems, he described the new system recently introduced in Buffalo. It is based on a different theory and overcomes in a practical manner all of the objections found in the older systems.

In this system each police box is provided with its own individual pair of wires which connect it to the switchboard in the station house, and the method of operation is very similar to that used in manually operated telephone systems. The advantages of this method of construction are:

First—It makes it possible for the desk sergeant to signal only the particular man that he desires to get in communication with.

Second—It permits the desk sergeant to select at will any one or more signal lights and to eliminate those which, under certain conditions, might be the means of assisting lawbreakers to escape.

Third—As it is always possible to get into almost immediate communication with all men on patrol duty, it is not necessary to maintain any reserves at the station house, thus making it possible to increase the number of men on patrol duty.

Fourth—The recording apparatus is separate and distinct from the signal equipment, although operated over the same line wires; therefore it is impossible for the operator or desk sergeant to produce false hourly report records.

Fifth—The use of individual circuits to each signal box limits the effect of line or box trouble to that one line; therefore only one box will be out of service. This reduces to a minimum the cost of maintenance, and also the lost time during which any part of the signal system will be out of service.

Inasmuch as most of the lines are underground, a cable distribution plan was developed, so that additional pairs of wires are available at the box. This makes it possible to transfer the box to another pair of wires, placing same in operation without having to wait until the trouble is cleared on the first used pair.

Special facilities were also provided in the construction of the apparatus so that defective parts could be replaced with a minimum loss of time.

The system itself is based on the use of telephone circuits, over which all of the various operations are performed. The visual signal operating in connection with each signal box is a standard fifteen-watt 110-volt tungsten lamp, suitably mounted on the pole by the use of an extension arm, so as to clear all obstructions on the street, such as poles, etc. The lamp itself is enclosed in a ruby glass globe.

In reply to questions from several of the members, Mr. Bauer stated that there was no trouble from induction, the cables used being of the telephone paper-insulated type. The farthest lamp from the station is about two and one-half miles. As regards trouble from moisture in cables, he said that such troubles are detected quicker in the use of paper-insulated cables than with rubber insulation. The minimum resistance of the cable used is 500 megohms per mile. There is no more danger to the cable in this service than in telephone service, and when a man opens a box there is no danger of electric light current being on the line.

Mr. R. A. Smith, of Norfolk, Va., exhibited and explained a chart showing graphically how the work of the Standardization Committee was distributed and assigned to the various members thereof. The plan enables members of the Association to obtain information on any subject coming within the scope of the committee's work, and will furnish valuable data.

C. R. GEORGE, SECRETARY.

On motion of Mr. Will Y. Ellett, of Elmira, N. Y., a vote of thanks was given to the committee for the excellent presentation of the subject.

On Thursday morning Mr. J. B. Yeakle, of Baltimore, Md., read a paper entitled "Common Battery Service Operating Fire Alarm Circuits."

The principal advantages in multiple supply to fire alarm circuits, said Mr. Yeakle, are economy in space, supervision and greater storage capacity. The application of the multiple battery system to the fire alarm circuits is only novel to the extent that it is a special application of well-known rules governing the supply from a common source.

To supply current to a number of fire alarm circuits absolute balance of the circuits is not essential, though modern practice suggests that the lines each take from the battery, comparatively, an equal charge. This is easily provided for by a resistance coil on each circuit which, in the absence of a milliammeter, can be adjusted with an ordinary current detector which can be made by the person in charge with a moderately good compass and a reasonably large coil of magnet wire.

The storage battery is best suited for the multiple service on account of low internal resistance and its ready response to the effect of the charging element. The plant should have a reserve battery to which faulty circuits can be transferred while being repaired. The reserve battery may be used for testing and other current supply separate from the bus bar to which the box circuits are connected. A ground on one circuit does not affect the balance on the others if the size of the plates are properly calculated for the maximum load of the battery.

In the Baltimore office, Type E-7 plates are installed, from which thirty-eight circuits are supplied and a regular current is furnished regardless of weather conditions. Some of these circuits are partly overhead.

In the discussion on Mr. Yeakle's paper Mr. A. C. Hatch, of Detroit, stated that storage cells with three square inches of positive plate per ampere-hour gave the best all round service. Plates with less unit surface were likely to be strained.

The next paper was entitled "Phantom Circuit Remote Control System," by H. H. Reeves, of the General Electric Company, Schenectady, N. Y.

Mr. Reeves stated that the General Electric Company had worked out and made commercially available a system of electric light control from the station or some central point, which the company had termed "Phantom Circuit Remote Control System."

Based upon the principle that a circuit can be used for more than one purpose at the same time, as in multiplex telegraphy, where several messages are sent over the same wire simultaneously, this new control system sent a small direct current over alternating current power lines without interfering with their functions of carrying power. This is accomplished by means of a reactance which offers little resistance to the passage of the direct current but offers sufficient impedance to the alternating current to prevent the grounding of the system. A polarized relay is used. The system was reliable, flexible and simple, he said. A circuit diagram accompanied the paper.

Mr. Reeves was followed by Mr. W. J. Canada, of the Bureau of Standards, Washington, D. C., who read a lengthy paper on "The Hazards of Domestic Electrical Appliances." He referred to the degree of success in reducing, and particularly in localizing, the electrical hazard problems, and gave a detailed statement of the things the Bureau has left undone as regards household hazards. "Our present electrical construction standards," he said, "both for fire and accident prevention, are the best in the world, and our inspection of new installations is the best organized, most thorough and effective.

"As far as electrical wiring installation is concerned, the fire loss is only a fraction of the total electrical fire loss; new wire hardly at all."

He offered concrete suggestions as to feasible steps in a proposed campaign to extend the usefulness of existing inspection systems to electrical systems of the home.

In the discussion of Mr. Canada's paper Mr. A. C. Hatch, of Detroit, said the small boy in the household was one of the greatest of dangers to electrical fittings, and thought the Bureau of Standards should take him into account.

A telegram was read from Dr. Charles P. Steinmetz, of Schenectady, N. Y., first vice-president, expressing his regret at his inability to be present at the convention.

At the afternoon session Mr. W. H. Flandreau, chairman of the Exhibition Committee, reported that the Association should get into closer touch with the Associated Manufacturers of Electrical Supplies, in order to get more numerous exhibits at the conventions.

Mr. J. S. Craig, superintendent of fire telegraph, Toronto, Ont., was elected a life member of the Association.

The election of officers then took place, and resulted as follows:

President, C. E. Diehl, Harrisburg, Pa.; first vice-president, J. H. Thomas, Scranton, Pa.; second vice-president, Claude E. Convers, San Antonio, Tex.; third vice-president, R. C. Turner, Atlanta, Ga.; fourth vice-president, A. Bell, Port Chester, N. Y.; secretary, Clarence R. George, Houston, Tex.; treasurer, W. H. Flandreau, Mount Vernon, N. Y.

Executive Committee: Jacob Grimm (chairman), W. P. Briggs, John Berry, W. L. Potts, J. J. Mulcahy, A. Frank, C. S. Downs, A. J. Balizet, A. E. Platt.

Atlanta, Ga., was selected as the place for the next meeting and the convention then adjourned.

ENTERTAINMENT.

Much credit is due to Mr. M. J. Donohue, city electrician of Niagara Falls, who had charge of the entertainment and exhibits, for the excellent manner in which he carried out the work. He saw to it personally that every one present had an enjoyable time, especially the ladies of the party. The entertainment programme was a very satisfactory one, and nothing was left undone to give all a good time. The beautiful weather contributed largely to the enjoyment.

On Tuesday the ladies made a trip through the Cave of the Winds and to points of interest around Goat Island. In the evening there was an informal reception at the International Hotel.

On Wednesday the ladies visited the shredded wheat factory, where a luncheon was served, and afterwards were taken by auto to Fort Niagara and through the Indian reservation. In the evening the party viewed the illumination of the Falls.

On Thursday the ladies took a trip on the steamer "Maid of the Mist," to the Horseshoe Falls, and in the evening visited the Cataract Theatre, the men attending a smoker at the Exempt Firemen's Club.

On Friday the entire party boarded a steamer for a trip down Niagara River to Buffalo as guests of the Gamewell Fire Alarm Telegraph Company. A lunch was served on the boat. The party was met at the dock in Buffalo by automobiles and driven through the beautiful parks and then to the Curtis aviation field, where a fine exhibition of aeroplane flying was witnessed. This feature was given through the courtesy of Mr. Jacob Grimm, superintendent of police telegraph, and J. G. Kraetz, superintendent of fire telegraph of Buffalo. In the evening the National Police Signal Company of Buffalo entertained the party at a dinner at the Maltosia Roof Garden, and thus ended one of the most successful conventions ever held by the Association.

The badges distributed to and worn by the members were of handsome and artistic design. Pendant from a ribbon of red, white and blue satin was a gilt medallion containing an embossed view of Niagara Falls, around which was a blue enamel band. On this band were the words "Niagara Falls, N. Y., September 11-14, 1917." On the surface of the medallion, at the lower right hand, was a small shield, also in gilt, bearing the letters "I. A. M. E." —the initials of the name of the Association. The ribbon was hung from a small oblong frame containing a space for the name of the member wearing the badge. The badges were made by Bastian Brothers Company, Rochester, N. Y.

EXHIBITS.

The Gamewell Fire Alarm Telegraph Company made an interesting exhibit of portable police apparatus, consisting of a two-circuit central office outfit for signaling and flash lighting, signal boxes and gong signals. Mr. A. L. Tinker and E. E. Salisbury represented the company. They distributed as souvenirs packs of playing cards; also pamphlets describing the company's police signaling systems.

The American District Telegraph Company had a complete exhibit board, demonstrating the manner in which signals can be received by throwing a ground switch when the metallic circuit opens. The simple throwing of the ground switch sends the battery through both sides of the metallic circuit, thereby allowing signals to be received at the signal station when the circuit is open. Every box carries an individual ground and, in connection with the main battery ground at the central office, makes the service complete in such a way that service is not lost unless both series lines to the building are open, and then all signals are received on either side of the breaks. The continual test of each separate device made by the subscriber's watchman assures perfect operation and fire department communication. The shunt feature on the box provides the fourth wire, and this shunt eliminates the possibility of interfering clashes that generally cause mixed signals at the central office. Every wire and instrument used is continually under test and very close supervision. The latest development is a box which serves three purposes: (1) supervision of watchman signals; (2) fire department calls; (3) interior fire alarm code signals. Every special feature is taken care of with separate brake wheels and line brushes. The brushes do not rest on the brake wheels until the box is put in service. The exhibit was in charge of Mr. H. C. Munchausen, district superintendent, Buffalo, N. Y.

ATTENDANCE.

Among those present were:

Allentown, Pa.—Mr. and Mrs. P. J. Beisel.
Altoona, Pa.—C. S. Downs, Donald Howard.
Anderson, Ind.—X. A. Stephens.
Atlanta, Ga.—Mr. and Mrs. R. C. Turner.
Baltimore, Md.—J. B. Yeakle.
Bayonne, N. J.—Mr. and Mrs. W. Arbuckle and daughter; C. H. Swifield.
Bradford, Pa.—C. Henderson.
Bridgeport, Conn.—Mr. and Mrs. A. E. Platt.
Buffalo, N. Y.—Gustav F. C. Bauer, F. D. Farrell, Jacob Grimm, J. G. Kraetz, H. C. Munchausen, W. J. Taggart, J. W. Tabb.
Camden, N. J.—J. W. Kelly, Jr.
Chicago, Ill.—H. A. Bowen, W. S. Boyd, A. P. Crocker, M. P. Ellis, J. M. Lorenz, Frank F. Stones.
Detroit, Mich.—G. A. Gantert, L. Gascoigne, A. C. Hatch, W. L. Potts.
Elizabeth, N. J.—Mr. and Mrs. F. R. Williams.
Elkhart, Ind.—Mr. and Mrs. E. C. Ciego.
Elmira, N. Y.—Will Y. Ellett.
Erie, Pa.—Mr. and Mrs. W. Crane.
Evanston, Ill.—F. S. Anderson.
Fort Wayne, Ind.—F. J. Dix, A. A. Serva.
Harrisburg, Pa.—C. E. Diehl.
Hibbing, Minn.—M. Henry.
Hoboken, N. J.—Mr. and Mrs. A. Frank.
Houston, Tex.—C. R. George.
Indianapolis, Ind.—Mr. and Mrs. John Berry.
Johnstown, Pa.—K. T. Hummell.
Meadville, Pa.—Mr. and Mrs. A. J. Balizet and two sons and daughter.
Memphis, Tenn.—R. E. Moran.
Milwaukee, Wis.—E. Karl.
Monessen, Pa.—C. N. Johns.
Moose Jaw, Sask.—J. D. Peters.
Mount Vernon, N. Y.—W. H. Flandreau.
Newark, N. J.—Mr. and Mrs. Adam Bosch.
New Bedford, Mass.—W. P. Briggs.
New Brunswick, N. J.—Robert Stuart.
New Rochelle, N. Y.—Mr. and Mrs. A. J. Bell.
New York—J. G. Kipp, Frederic Nicholas, Fred'k Pearce, T. R. Taltavall, A. L. Tinker, E. E. Salisbury, J. M. Spader.
Niagara Falls, N. Y.—M. J. Donohue, R. D. Miller, G. W. Whitehead.
Norfolk, Va.—R. A. Smith.
Oswego, N. Y.—Frank H. Ducette, H. A. Lass.
Perth Amboy, N. J.—Mr. and Mrs. J. B. Franke.
Philadelphia, Pa.—C. M. Thompson.
Pittsburgh, Pa.—R. W. Abbott, C. E. Corrigan.
Pittsfield, Mass.—B. Cummings.
Rochester, N. Y.—J. T. Barrett, E. H. Schmitt.
San Antonio, Tex.—C. E. Convers.
Schenectady, N. Y.—Mr. and Mrs. F. A. Barron, H. H. Reeves.
Scranton, Pa.—J. H. Thomas.
Toledo, Ohio.—Mark Winchester.
Toronto, Ont.—J. S. Craig.
Troy, N. Y.—P. H. Corbett.
Utica, N. Y.—T. F. Marron.
Ventnor City, N. J.—A. C. Farrand.
Wallingford, Conn.—Mr. and Mrs. A. L. Pierce.
Washington, D. C.—W. J. Canada.
Watertown, N. Y.—W. E. Gaffney.
West New York, N. J.—E. H. Benz.
Wilkes-Barre, Pa.—D. J. Morgan, P. H. McManus.
Yonkers, N. Y.—J. J. Mulcahy.
York, Pa.—J. I. Strebig.

MR. JEFF W. HAYES' DEPARTMENT.

The Pleiades Club in Book Form.

Mr. Jeff W. Hayes, of Chicago, has issued in book form the story of the doings of the Pleiades Club, which have been running in this journal for some time past. The story is divided into twenty-two chapters. It recalls many famous old-timers who have passed from this life into that beyond, and is very entertaining. The book is sold for 50 cents per copy, and copies may be obtained by addressing J. B. Taltavall, Publisher, TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York, or Mr. Hayes, 5353 Glenwood Ave., Chicago, Ill.

The Pleiades Club.

CHAPTER XXII.

"The faults of our brothers we write upon sand,
Their virtues, upon the tablets of Love and Memory."

Thus quoted Michael J. Burke, as he came down the Rue Verne, on the arm of his friend, Charlie Vivian, so beloved on earth during his career there. Behind this twain came Nicholas Courcey Burke, arm in arm with Joseph E. Hurley.

"You are right, Mike Burke," said Joe Hurley, "I want to have my faults written on the sands, for I really did have a tempestuous time on earth, but, while I am contrite and repentant, I am not remorseful, for that would be a state of affairs not permissible on the Planet Mars.

"I enjoyed that write-up by one of my friends recently published, and I only regret that I did not write more stories, as I have a fund of delightful tales to tell."

A whispered conversation occurred between Hurley and Courcey Burke, the latter suggesting a method of giving the stories publicity, and Hurley nodded his pleasurable satisfaction. So our readers may look for some post mortem stories from the brain of Joseph E. Hurley.

The Thunderbolt Express arrived ahead of time today, bringing with it some old-timers, among whom were the following: Sam Wingate, Hank Martin and Elmer E. Mallory, of the Pacific Coast.

In introducing the new arrivals to the Pleiades Club, Dr. O. P. S. Plummer took occasion to refer especially to Elmer Mallory. He stated that Mr. Mallory had graduated from the high school at Portland, Ore., and immediately began the study of telegraphy, and seven months later was appointed night operator at Salem, Ore. His father, Hon. Rufus Mallory, had been contemplating a journey around the world, and had postponed the trip, pending his son's graduation. When Elmer was told of his father's plans for him, he startled the parent by a positive refusal to go, stating that he would lose his job if he went, and that he would sooner stay at home and telegraph than go on a trip around the world.

Twelve years later, however, the glamor of telegraph life had worn off and Elmer Mallory became a practicing attorney.

Word had been received from the planet Jupiter that a ballot cast to determine who was the most popular lady on the planet resulted in the selection of Mother Eve, and she was at the same time voted to be the most beautiful woman on Jupiter.

When it came to getting out a similar ballot for the men, Adam begged that his name be dropped, apologetically remarking he had never done anything for his posterity worthy of praise or laudation, and Abraham was elected as the most popular man on Jupiter, which seemed to give widespread satisfaction, especially among the Semitic brethren. Moses was a good second.

There seemed to be more life and hilarity on Jupiter than was experienced on Mars, due probably to the fact that there were more really old-timers on the former planet and there was so much more to study.

This fact had been communicated to Secretary Moxon, who bulletined the same with his wireless stylus, and another party was formed to proceed to the far-off goal.

Mars will never be deserted, of course, but there will be many houses with the sign "To Let" exhibited around Hesperian Canal.

Joe Hurley was the first to register as a passenger for Jupiter. He did not care so particularly about going, he said, but he merely wanted to be "doing something." The long, free ride may have been an inducement.

The Burke brothers declined to accompany him, as they were expecting some new acquisitions from their beloved Canada on a near date, probably some heroes of the great war.

The earthly correspondent for the Pleiades Club has recently been undergoing some unpleasant experiences, which will account for the less interesting chapter presented, but he promises that many beautiful pen pictures will be drawn in the future for these columns, so the widespread interest in the Pleiades Club will not be abated.

LETTERS FROM OUR AGENTS.

New York Postal.

Manager J. J. Whalen, and assistant traffic chief William H. Kelly, have returned from vacations.

Thomas C. Zoebelein, assistant traffic chief in city, and Miss Mary F. Zeitler were married August 26.

Junior assigned to wires: Edward J. Rankin, Jr.

Arrivals.—L. Townseld,, J. Donnelly, J. F. Colbert, E. C. Williams, E. Cook, G. W. Kibbee, R. M. Pendergast, J. P. Tighe, A. Debrosky, J. H. Duskin, and Miss Jeanette Friedman.

Departures.—Miss M. Lang, Miss Mary J. Shanahan, C. C. Brown, M. E. Fisher, C. O. Bockmeister, J. Katz, J. J. Meyer and James Brady, who is now located at Waterbury, Conn., working local.

Printers.—Resignations, Miss Olive Marvin.

Vacations—Miss May Taylor, Miss Helen Tierney, Miss Sylvia Brown.

Recent appointments on printers.—Mrs, Mable Plant, Miss Mable Barrett, Miss May O'Connor, Miss Minnie Moretti, Miss E. F. Nicholson, Miss H. S. Shilling, John Bockery, Emanuel Nathan, James Geary, Mrs. A. Devandorf, Miss M. E. Nicholason, Miss O. Marvin.

New York Western Union.

Enrique Palacio, chief of the Insular Telegraph System, Porto Rico, was a visitor in this office September 25, and was much interested in the equipment.

W. R. Lawrence is acting chief clerk of the operating department, vice W. R. Taylor, who is spending a three months' leave of absence with his parents in South Carolina.

Quite a number of the pensioners are helping out during the present emergency caused by a shortage of operators. They are all rendering good service and the quality of their work shows that they are capable of holding their own with many of the up-to-date members of the craft.

A Morkrum printing equipment has been installed between this office and the West Thirty-first Street branch office.

An orchestra in connection with the Western Union Educational Society has been organized. It consists of fifteen instruments and it is expected that it will give a concert within the next three months.

Active preparations are being made by the Commercial News Department to take care of the World's Series baseball games; also the election returns in November.

Several of the operators from this office who are doing service "Somewhere in France" are continually writing to friends. They are all satisfied with their lot and it is expected that they will render a good account of themselves at the front.

The Service Department Wins the Baseball Championship.

The Western Union Baseball League, held under the auspices of the Western Union Educational Society, New York, closed on September 23. The Service Department and Commercial News Department were contestants for the beautiful trophy, a silver cup, which was donated by the Western Union Educational Society.

The Service nine won by a score of 10 to 4. This was the deciding game of the series and it was full of interest to the members of the telegraph profession of Greater New York. The game was witnessed by over 700 interested telegraph spectators.

The contest the week previous was one of the strongest and best games played of the series. It was between the Commercial News Department and the Service Department, resulting in a score of 4 to 2 in favor of the former. This game brought the Commercial News Department team up to one-half game behind the Service team. The close score made the final game the more interesting.

The league started with five teams, namely, the Service, Commercial News, Clerical, Multiplex and Bookkeeping departments. The fight soon dwindled down to the two best teams eliminating all others from the battle.

The two final games were full of thrilling and spectacular plays by both sides.

After the final contest the Service rooters carrying the trophy did the snake dance amidst volumes of cheers.

STANDING OF THE CLUBS.

	Won.	Lost.	Per cent.
Service	6	2	.750
C. N. D.	5	3	.625
C. and C.	2	2	,600
Clerical	1	3	.250
Multiplex	1	3	.250

The players in the final game were: Service, Messrs. Kreuse, 1b.; Rokuson, c.f.; Greenburg, p. and r.f.; Seaman, l.f. and p.; McIntire, 3b.; Harrington, 2b.; Einstein, c.; Silverman, s.s.; Lindorfer, r.f. Commercial News, Messrs. Dickstein, 3 b.; Manning, s.s.; Stoller, c. f.; Carter, c. f.; Murphy, c.; McGivern, l.f.; Deperino, l. f.; Finn, r. f.; Shaw, 2 b.; Anderson, 1 b.; Fero, p. Mr. Hanesel acted as umpire.

The presentation of the trophy to the winning team will take place on October 4 at the Orpheum Theatre, Brooklyn.

The Western Union Educational Society has arranged for a game to be played with the Philadelphia Western Union team at Philadelphia in the near future.

Baby Margaret Palmer, the two-year-old daughter of chief operator George E. Palmer, was the mascot of the Service Department team, which won the championship trophy.

Boston Western Union.

Although the summer offices on Cape Cod and at the beach resorts along the Atlantic Coast between Buzzards Bay and Eastport are about closed, the volume of business handled daily through this great New England relay point continues heavy and the force is constantly employed to the limit. True descendants of their hardy forebears, whose Americanism shines so brightly in history, these present day Bostonians are "doing their bit" willingly and without ostentation. Minus any loud trumpetings the Boston traffic force subscribed to some $30,000 worth of the first Liberty Bond issue.

Chief Operator J. B. Rex is enjoying a well earned vacation. During his absence Allan Stevenson, assistant chief operator in charge of force, is very ably directing "affaires de office." Mr. Stevenson is deservedly popular with the main office force, being highly esteemed for his affability and courteousness.

Smith C. Tugo, of the night force, has the sympathy of all because of the loss of his son, who was killed in France when the Germans made an airship attack on the Harvard hospital unit, of which he was a member.

L. J. McLeod, senior supervisor of the city lines, assisted by city supervisors D. J. Shine and Mrs. A. R. Cullenz, is keeping the delays in that department down to a minimum.

James Riordan, first class Morse operator, as well as a star newspaper telegrapher, will be greatly missed. He has been appointed sergeant in the Signal Corps and has joined the colors.

George J. Munroe, probably the most expert cable operator in Boston, capable of working at lightning speed either by Morse or Continental, has likewise gone into the Signal Corps, having been made a corporal. "Munny" is also some motor cycle artist, and Uncle Sam has taken over a genuine scintillator of the first water.

H. L. Flynn, Jr., son of repeater attendant Harry Flynn, has enlisted in the signal service and is already en route for "Somewhere."

Walter Runnells, formerly of the Boston Barclay department, is with us again, having been transferred from Washington. "Runny," who is a night multiplex attendant, says it seems just like coming home.

Supervisor G. H. Batho has returned from sick leave.

Assistant Chief Operator O. H. Chambers, in charge of traffic; Charles E. Perkins, test board attendant, and Supervisor John P. Duggins, of the night force, are on their vacations.

It seems very strange that we are not to have the World's Series baseball games this year in Boston.

Philadelphia Postal.

William G. Kurtz, of our fast Pittsburgh bonus circuit, has the sympathy of the operating department upon the death of his son, Rodney B., aged eight, who died September 17.

John Williams, operator, and well known in New York and Boston, died September 14, after a lingering illness.

Vacationists are returning to duty, among them being Manager J. H. Wilson, from a much needed rest at the shore; Concentration Monitor P. J. Reilly, at Wildwood, and Traffic Chief R. M. Massey from a motor trip through Delaware and Maryland.

Detroit Western Union.

John H. Kane, aged fifty-six years, died suddenly at his home in this city, on September 11. For thirty-five years he had been connected with the Western Union Telegraph Company, entering the service in 1881. He worked at Chicago, Toledo, Cleveland and New York, and returned to Detroit in 1887, where he has since remained. The funeral was largely attended by members of the Detroit telegraph fraternity, and many friends oustide of the telegraph service; also by members of the Detroit Order of Eagles, of which he had been for several years the secretary and treasurer. Many beautiful floral tokens of esteem were sent to his home, among the finest being a large broken column from his associates in the Western Union. Of late years his services with the Western Union had been of a supervisory nature. He is survived by his mother and three sisters.

Rubber Telegraph Key Knobs.

No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fit snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. Address orders to TELEGAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York.

More Thirty-fifth Anniversary Congratulations.

Among those who have added their names to the list congratulating this paper on the thirty-fifth year of its usefulness are G. R. Shultz, Fort Myers, Fla.; Wm. Maver, Jr., New York; C. M. Holmes, Jacksonville, Fla.; Jeff W. Hayes, Chicago; Arthur Coleman, New York; Thomas E. Fleming, New York; D. A. Mahoney, New York; R. F. Finley, superintendent telegraph, New York Central Lines, Cleveland, Ohio, and Hon. Walter C. Burton, postmaster, Brooklyn, N. Y.

Telegraph Neurology.

Mr. Rex D. Miles, of Centralia, Wash., has just issued a pamphlet on Telegraph Neurology, in which are given rules for the proper nervous control of the sending arm.

Until the advent of the sending machine, operator's paralysis was a very common malady, but little of this complaint is now heard of, because the use of this machine before the "grip" is lost prevents the excessive fatigue of the hand and wrist which is the underlying cause of the "cramp." Much is still heard, however, of poor senders, with the key and with the sending machine, and it is to help this class, as well as the operator whose "grip" is failing him, that this treatise has been written. It shows the poor hand or machine sender and the man afflicted with "cramp" how he may recover his expert sending ability, giving the reasons therefor.

The price of this treatise is $1.00 per copy, and it will be found a good investment by those who desire relief from operator's paralysis and lack of control of the nerves of the arm.

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33d YEAR

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Telephone Building, 24 Walker Street. Room 1129. Daily 9 a. m. to 2 p. m.

Saturdays 1 p. m.

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NEW YORK, OCTOBER 16, 1917.

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Teaching Telegraphy Phonetically.

The phonetic system of teaching telegraphy described by Mr. C. H. Weiser in our issue of October 1 is attracting wide interest and favorable approval. It is a novel method of teaching the art and seems destined to become universal. There is much in its favor, and little against it, except, perhaps in a few instances where deep-dyed-in-the-wool adherents of the old system stand out against any innovations, simply because they learned by the dot-and-dash method and that, according to their stagnant minds, cannot be improved on.

That there is merit in the new system is evident from the fact that the Western Union Telegraph Company has approached the subject seriously. It conducted preliminary tests at several of its larger offices during the latter part of 1916, and the results were such as to justify it in making a comprehensive study of the subject, and it expects to undertake the test shortly.

Mr. Weiser himself told of the success that had attended his work in teaching classes for Signal Corps service, which was remarkable indeed. If one class of a miscellaneous aggregation of students can receive fifteen or twenty words per minute after two months' instruction without learning the time-honored code, it is safe to assume that other classes can do the same. Under similar conditions those of the class who knew the code could receive only five to seven words a minute. These facts furnish a basis for some interesting calculations and hold out a hope for the companies to extricate themselves from their present difficulties brought about by absorption of their operators into government service.

Brave Wireless Operator.

The bravery of wireless operators who follow the sea is proverbial and the accounts of the heroic acts of many of these fearless men will go down in history as models of courage in the face of extreme danger. The list of these brave men is a long one and the world has shown a lively disposition to honor their deeds. They have saved many lives by their faithful attention to duty and in many cases have lost their own lives that others might live.

One of the most notable instances of this kind is that of the wireless operator on the English drifter "Floandi," which was attacked by Austrian cruisers in the Adriatic Sea last May. This brave man stuck to his post and was killed by a fragment of a shell while making a record in his log. The log was perforated and the line he was writing was unfinished when death overtook him. As a token of his bravery the English Admiralty has placed the log in the National War Museum in London, and wrote a touching note to the operator's parents, commending their son's courage and devotion to duty.

Such acts as these excite the sympathy and admiration of the entire world and are entitled to public recognition.

Liberty Bonds.

Telegraph and telephone employes responded generously and enthusiastically to the call of the government for loans on the first Liberty bond issue, and now they have another opportunity to help their country and themselves by subscribing to the second call, but on better terms. Four per cent. per annum will be paid for the second loan, and this is about the highest rate paid by savings banks on deposits. The first Liberty bonds automatically become a four per cent. investment with the second bonds.

The new bonds are issued in denominations of $50 and multiples thereof, and interest will be paid thereon at the rate of four per cent. per annum, payable semi-monthly. For the benefit of those who cannot pay the amount of their subscription in a lump sum, easy terms have been arranged as follows: Two per cent. of the total to be paid at the time of application; eighteen per cent. on November 15; forty per cent. December 15, 1917, and forty per cent. January 15, 1918.

In the case of a $100 bond, you pay $2 when you buy, $18 on November 15, $40 December 15, and $40 January 15. When the subscription is fully paid the bond or bonds will be delivered. These bonds are practically exempt from taxation for people of moderate incomes, and should a future issue of bonds bear a higher rate of interest the earlier bonds can be converted into the bonds bearing the higher interest.

This is certainly a splendid opportunity to participate in one of the most secure investments in the world. Any bank or trust company will give aid and information to any one desiring to subscribe.

PERSONAL.

Mr. F. E. Parham of the telegraph department, general offices, Santa Fe System, Topeka, Kan., accompanied by his father, Wm. M. Parham of Cheney, Kan., was a Philadelphia and New York visitor last week.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. A. J. Eaves, of the electrical engineer's office, New York, was a recent visitor at the Philadelphia office.

Mr. T. Fehrman, manager of the Calumet, Mich., office, received a surprise on his recent birthday in the form of a gift of a draft for $1,000, and he is so happy over it that he wants everyone to know of his good fortune.

Mr. C. F. Wright, formerly chief operator at Des Moines, Iowa, was recently recommended for a commission in the Signal Corps.

Mr J. J. Cardona, assistant treasurer, and Mr. R. Gould, of Vice-President W. I. Capen's office, are absent on their annual vacations.

Managers Appointed.—Charles C. Nickles, Monrovia, Cal.; Clarence C. Berg, Santa Fe, N. M.; George S. Owens, Albion, N. Y.; E. K. Baker, Carlisle, Pa.; F. S. Waldorf, Waterbury, Conn.; C. A. Miller, Chester, Pa.; Miss N. Nixon, Hannibal, Mo.; C. F. Happersett, Lamar, Col.

Mr. F. C. Lacey, manager of the Asbury Park, N. J., office of this company, who had charge of the Waterbury, Conn., office temporarily, has returned to Asbury Park.

Presentation to Mr. and Mrs. Ward.

The executive officers and the operating staffs of the Commercial and Commercial Pacific Cable Companies presented Mr. and Mrs. George Gray Ward, on the occasion of their golden wedding, with an after dinner set, including, with the larger pieces, a dozen cups and saucers with pierced decorations and porcelain linings and the smaller accessories. The tray supporting the larger pieces is inscribed: "Congratulations from China, the Philippine, Ladrone, Midway and Hawaiian Islands, Cuba, United States, Canada, Newfoundland, Azores, Great Britain, Ireland and France." The work was performed by Messrs. Tiffany.

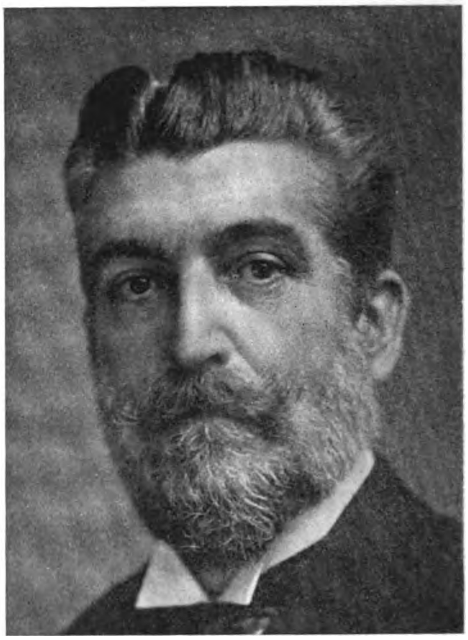
An illuminated address, bound in golden tinsel, said:

"The president and executive officers for themselves individually, and on behalf of the staffs of the Commercial Cable System, in China, the Philippine, Ladrone, Midway and Hawaiian Islands, Cuba, United States, Canada, Newfoundland, Azores, Great Britain, Ireland and France, unite in offering to their colleague and general manager and his most estimable wife their heartiest congratulations on the golden anniversary of their wedding, and most sincere wishes for many more years of happiness."

Mr. Ward's Golden Wedding.

Mr. and Mrs. George Gray Ward, of 51 West Fifty-third Street, New York City, celebrated their golden wedding on October 15.

Mr. Ward, who is vice-president and general manager of the Commercial Cable Company, is recognized as the dean of the cable-telegraph profession. He has been connected with cable enterprises since his youth, and with the Mackay cable and telegraph interests for the past thirty-four years. He probably is the best known telegraph man in the world, having carried his influence in submarine cable matters to all parts of the globe. The transpacific cable between the United States and the Far East, financed by the late John W. Mackay and completed by his son, Clarence H. Mackay, in 1902, is largely the result of Mr. Ward's labors and enterprise. He has received several foreign decorations for meritorious service in the development of cable communication.



GEORGE GRAY WARD.

Mr. Ward was born at Great Haddam, Hertfordshire, England, December 30, 1844, and was educated privately at Cambridge. He received a prize for his knowledge of telegraphy at the age of ten years. He was one of the few who stuck to his post at Alexandria, Egypt, during the cholera plague in 1865. He was a member of the electrical staff of the steamship "Great Eastern" when that vessel laid a cable across the Atlantic in 1869.

Mr. and Mrs. Ward have three living children, Dr. George Gray Ward, Jr., who is professor at Cornell Medical College and one of the foremost gynecologists; Sidney Ward, a member of the New York Stock Exchange, and Mrs. H. H. Hough, wife of Captain Hough of the United States Navy. Mrs. Hough was presented at the Court of St. James in 1912.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

MR. NEWCOMB CARLTON, president, attended a celebration of the Rochester, N. Y., Chamber ot Commerce a few days ago.

MR. G. W. E. ATKINS, first vice-president of this company, is taking an automobile tour through the eastern states.

MR. T. W. CARROLL, general manager, New York, spent a few days recently in Chicago,

CONFERENCE.—A conference of district commercial superintendents of the Eastern Division was held at 195 Broadway, New York, October 2 and 3, to discuss the recent rearrangement of the districts of that division and other matters connected with the service. Among those present were T. W. Carroll, general manager of the Eastern Division, and the following district commercial superintendents: C. F. Ames, Boston, Mass.; J. W. Reed, Manchester, N. H.; J. S. Calvert, Philadelphia, Pa.; C. B. Horton, Pittsburgh, Pa.; E. P. Griffith, Jersey City, N. J.; W. A. Sawyer, New York; A. Woodle, Buffalo, N. Y., and H. F. Taff, general superintendent, Washington, D. C. Others present from New York headquarters were Lewis Dresdner, treasurer; F. T. Albert, Gardner Irving, J. A. Hill, T. E. Fleming, W. S. Fowler, J. Simmonds, M. Quinlan and A. O. Wallis. Mr. Newcomb Carlton, president, and Mr. J. C. Willever, vice-president in charge of commercial, made addresses.

MR. ASHTON G. SAYLOR, formerly general manager of the Eastern Division, accompanied by Mrs. Saylor, has just returned to his home at East Orange, N. J., after a three months' absence, sojourning along the Maine coast and touring through the mountains and lakes of New Hampshire and northern Maine.

MR. W. W. HOSKINS, formerly chief operator of the Montgomery, Ala., office, now occupies a similar position at San Diego, Cal.

MR. O. A. CARROLL, of the Keokuk, Iowa, office has been appointed manager at Iowa City, Iowa.

THIS company has moved into its new office at Augusta, Ga. It is modern in every respect.

THOMAS P. MCKINNEY, aged fifty-eight years, chief operator for the Western Union Telegraph Company at Spokane, Wash., died suddenly of apoplexy at his home in that city, September 25. He retired in the best of health and was found dead in bed next morning.

Daniel F. Delahunt.

Mr. Daniel F. Delahunt, for over a quarter of a century a familiar figure in Western Union circles in Chicago, recently accepted a position in the office of E. E. McClintock, district commercial superintendent, Denver, Col. "Dan," as he is generally known in Chicago among his many friends, has been so closely identified with the interests and conduct of Western Union affairs in that city that when the news of his transfer to Denver was spread abroad in the first district it was received with deep regret. No man in the entire Western Division was ever more loved and respected than "Dan" Delahunt, and he won his way into all hearts by his loyalty, his unfailing kindness and readiness to go out of his way to assist his fellow employes along the road to efficiency. It is claimed that "Dan" knows the tariff book by heart, and it is certain no one ever came to him for information or advice and went away without a correct solution of his problem.

DANIEL F. DELAHUNT.

Mr. Delahunt has filled numerous positions during his long term of service in Chicago—operator, branch office manager, chief clerk to the superintendent of city lines—and for some years past has been attached to the personal staff of the Chicago district commercial superintendent. For nearly thirty years he has served the Western Union faithfully and loyally, the only break in his service having been during the Spanish-American war, when "Dan," always ready to "do his bit," served for a period of three years in Porto Rico and the Philippines.

The esteem in which Mr. Delahunt is held by his Chicago friends was evidenced at a farewell dinner tendered him on the eve of his departure for Denver, at which covers were laid for fifty-two guests. The scene of the affair was at the Palmer

House, and representatives were present from the commercial, traffic and plant departments, as well as specially invited guests from the General A. W. Greely Camp, United States Spanish War Veterans, of which Mr. Delahunt is an honored member.

Mr. H. W. Baker, manager of the credit department, was master of ceremonies and kept things moving without a hitch. Speeches which brought tears and laughter in turn evidenced the hold "Dan" has on the affections of his comrades within and without Western Union circles. The speakers were Captains Lee and McConnell and Comrades Konigsmark, Gill and Eggleton, of the Spanish War Veterans, and Messrs. M. F. Strider, L. F. Baker, M. J. Tully, J. D. Clarke, Geo. Byington, Wm. Griffin, W. H. Kennedy and others of the Western Union.

Mr. F. B. Travis, district commercial agent, attached to the office of District Commercial Superintendent H. Brown, in a speech which was particularly apropos, presented Mr. Delahunt with a sterling silver fountain pen as a gift from his friends, and paid a fitting tribute to the character, ability and loyalty of the guest of honor. Mr. Travis also read an original poem written by a deskmate of Mr. Delahunt in Superintendent Brown's office.

THE CABLE.

Mr. F. B. Gerrard, general superintendent, Commercial Cable Company, New York, has returned to his office after an extended trip to Nova Scotia.

Mr. Thomas F. Foley, superintendent of the Western Union cable station at Hammels, L. I., has returned from his extended trip to the cable stations of Newfoudland.

Mr. S. H. Strudwick of the Western Union cable station, North Sydney, N. S., is in New York visiting friends and consulting oculists in regard to his failing eyesight.

The Second Multiplex circuit between New York and Hearts Content, N. F., was put in operation, by the Western Union Telegraph Company, on October 9, with satisfactory results.

The World's Series baseball scores received special attention in the Central Cable Office, New York, and were forwarded in record time to the United States soldiers located in France, and to Havana, Cuba.

Mistook Cable Steamer for an Enemy Craft.

On the recent return trip of an American supply ship the lookout sighted a strange looking craft and something bobbing up and down in the water nearby, which was thought to be a submarine. When the supply ship got near enough it opened fire on the supposed U-boat, but fortunately failed to hit the mark. At the first shot the strange steamer hoisted the signal to cease firing, and explained to the warlike supply boat that she was the cable steamer "Mackay-Bennett," engaged in replacing a section of one of the transatlantic cables; and that the bobbing object which had been made a target was only a buoy supporting one of the loose ends of the cable.

Return to Legal Time.—The clocks in France were put back one hour, to legal time, October 7, and the same was done in Newfoundland on September 30.

Cable Interruptions.

Interruptions to submarine telegraph cables are reported to October 9 as follows:

Azores and Emden (two cables), August 5; Shanghai and Tsingtau, and Tsingtau and Cheefoo, August 24; Sweden and Germany September, 30; Almeria and Melilla, October 1; Penogomera and Alhucempas (defective cable) October 1; Yap and Menados (offices closed), October 7; Obock and Djibouti, November 6; Constantinople and Tenedos, November 6, 1914; Singaradja and Ampenan, January 31, 1917; Valdez and Seward, September 14, 1917.

CANADIAN NOTES.

A. D. Campbell, chief operator of the Great North Western Telegraph Company at Winnipeg, Man., died in Pasadena, Cal., September 26. Mr. Campbell was well known throughout western Canada and in the Pacific Coast states, and is survived by his wife and two children. He was agent for Telegraph and Telephone Age at Winnipeg and was well liked.

THE TELEPHONE.

Farewell Dinner.—The New York Telephone Company gave a farewell dinner at the Down Town Club in Newark, N. J., on the evening of October 8 to eighty-four of its employes in the New Jersey Division who are members of the New Jersey contingent of the Signal Corps, United States Reserve. Colonel J. J. Carty, chief engineer of the American Telephone and Telegraph Company, made an address.

Robert M. Pitts, manager of the Chesapeake and Potomac Telephone Company, Hagerstown, Md., was married to Miss Blanche Lee Keech, of Baltimore, Md., in the latter city, September 25.

Morris H. Gref, aged sixty years, a pioneer telephone lineman, died in Brooklyn, September 26. He started as a messenger for the American District Telegraph Company, later becoming connected with the Metropolitan Telephone Company. He afterward joined the Postal Telegraph-Cable Company.

English Over Paris Telephones.

The Paris authorities have modified the rule laid down at the beginning of hostilities that no language but French should be used over the telephone by permitting the use of English hereafter.

What Can be Done by a Telephone Call.

Somebody engaged in a phase of the electrical business has written a list of things that can be done with one cent's worth of electricity—not the same cent's worth, of course. It is interesting to think of the things that can be done with the aid of one telephone call, says *The Transmitter*, of Baltimore. The only difficulty about making up such a list is that it stretches out indefinitely.

Here are some of the things that could be put down:

Order a meal from across the street.

Get somebody to let you out when accidentally locked in.

Cheer up some poor lonely soul.

Call an Irishman hard names at a safe distance.

Make an apology that would be embarrassing face to face.

Make a young man happy for the rest of the day.

Make a young man sad for the rest of the day.

"Start something."

"Bust up the party."

Reunite a pair of scrappy lovers.

Give wings to a scandal.

Help a friend out of an embarrassing position.

Allow a man to build up a reputation for flattery.

Advertise a soft voice.

Of course there are other things that a telephone call will do, and you have our permission to extend the list as far as you like.

History of Telephone Exchanges.

The Telegraph and Telephone Exchanges: Their Invention and Development, is the title of a book published recently in London by J. E. Kingsbury, who is one of the leading authorities on telephony. This book deals with the history of the telephone industry, and its thirty-three chapters cover every point of the development from the "spoken word" up to the present time. It is a very complete and faithful record of the wonderful and rapid advances made in telephony, and covers long distance telephony in a very able manner. The book has 558 pages and 169 illustrations, and is sold for $4.00 per copy. Orders will be received by TELEGRAPH AND TELEPHONE AGE, John B. Taltavall, publisher, 253 Broadway, New York.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager, accompanied by Mr. R. A. Weagant, chief engineer, and Mr. David Sarnoff, commercial manager, has returned from a business trip to Washington.

Mr. J. de Jara Almonte has arrived home from Venezuela, where he went on business of the company.

Wireless Telegraph Log.

The log of the wireless operator on the English drifter "Floandi," which was attacked by three Austrian cruisers in the Adriatic Sea last May, has been recovered and placed in the National War Museum in London. The operator continued to send and receive messages until he was killed by a piece of shrapnel while writing in the log. The piece of shell perforated the log and the line made by the operator's pencil when he was hit and collapsed can be seen on the page upon which he was writing. The operator was found dead in his chair lying over the log.

In deciding to preserve the log the Admiralty, in a letter to the operator's parents, said that it was done "so that your son's name and the example of courage and devotion to duty which he showed in his death, will remain on record for all time."

Institute of Radio Engineers.

The October meeting of the Institute of Radio Engineers was held in the Engineering Societies Building, New York, October 3. Mr. Robert Boyd Black, of the United States Naval Reserve Force, presented a paper on "Radio telegraphy in competition with wireless telegraphy in overland work." This extension of the use of radio communication was critically considered and important considerations of its future developments were explained.

Locating Trouble in Wireless Apparatus.

The wireless operator at sea occasionally meets with difficulties that put his technical knowledge to a test, for wireless apparatus, like any other physical creation of man, cannot be depended to work with unfailing satisfaction year in and year out. The land station operator usually is more fortunate as regards assistance in time of trouble, for generally there is an expert around to call upon.

One of the troubles that is liable to occur while sending is the sudden stoppage of the spark. The thing to do under such circumstances is to trace the cause of the trouble to its source. The following method to do this is given in "How to Pass a Government Wireless Examination," a book which every wireless man should possess:

In case the spark gap stops suddenly while sending, the source of trouble may be traced in the following order: If the motor-generator itself has not ceased operation from a blown fuse at the direct current switch, the fuses in the circuit from the alternating current armature may have blown or the line to the generator field windings may have been interrupted at some point. Or there may be an open circuit in the primary winding of the transformer, or a short circuit in the secondary winding.

If the equivalent contains a stationary spark gap there is a possibility that the spark electrodes may have fallen together, thereby short circuiting the transformer. Or perhaps while sending the high potential condensers may have punctured. Leakage through the walls of the spark muffler may be experienced or the insulating bushings around the high potential terminals of the transformer may break down, causing leakage through the lid.

The remedy for a blown fuse is obvious; it only needs to be replaced. Should a test indicate that the generator field winding is open, it is probable that the generator field rheostat is burned out. The burnt-out section may be located by a battery and telephone test circuit and then shunted by a piece of wire. If the test indicates a short circuit in the primary winding of the transformer, it can readily be removed and repaired by the operator at sea. A greater difficulty is encountered should the test indicate a burnt-out secondary winding. If the transformer is wound in sections, as many high potential transformers are, the burnt-out section can be located and should then be removed from the magnetic field of the primary winding, the remaining secondary winding being connected in series and the transformer operated at a lower potential.

Punctured condensers should be replaced by the spares ordinarily furnished to each vessel. If no spares are available a parallel connection of the remaining condensers could be made, affording the same capacity as that previously used; but the transformer must then be operated at a lower primary voltage. Often leakage in the spark gap muffler may be stopped by wiping it out with a piece of dry waste, but if the leakage is abnormal the muffler may be removed entirely and the spark gap temporarily supported and operated in the open air.

Practical Wireless Telegraphy.

The book recently brought out under the title "Practical Wireless Telegraphy," by Elmer E. Bucher, instructing engineer of the Marconi Wireless Telegraph Company of America, is meeting with a large demand. It is a complete textbook for students of radio communication in which the author has endeavored to give the non-technical student and the practical telegrapher an understanding of the functioning of present day commercial wireless telegraph apparatus.

Each topic is treated separately and completely, furnishing progressive study from first principles to expert practice. Starting with elementary data, it progresses, chapter by chapter, over the entire field of wireless, fundamentals, construction and practical operation.

The book is 6 x 9 inches in size, and contains 330 pages and 350 illustrations. It is substantially bound in cloth and the price is $1.50 per copy. This is a remarkably low price for a book of this size. One purchaser writes: "The first thirty pages are alone worth more than the cost for the entire work."

For sale by TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

Items of General Interest.

THE NOBEL PRIZES.—Five prizes are annually awarded from the fund of $9,000,000, bequeathed for the purpose by Alfred Bernard Nobel, a Swedish inventor, who died in 1896. From the invention and manufacture of dynamite and smokeless powder, he made his fortune. The prizes average about $40,000 each, annually, and, with gold medals and diplomas, are awarded on December 10 each year, the anniversary of the death of the founder. The sum available for the prizes is divided into five equal parts and distributed as follows: "One is to the person, who, in the domain of physics has made the most important discovery or invention; one to the person who has made the most important chemical discovery or invention; one to the person who has made the most important discovery in the domain of medicine or physiology; one to the person who in literature has provided the most excellent work of an idealistic tendency, and one to the person who has worked most or best for the fraternization of nations, and the abolition or reduction of standing armies, and in the calling and propagating of peace congresses."

UNITED STATES FLAG REGULATIONS.—The following rules concerning the Flag have been formulated by the Sons of the Revolution:

It should not be hoisted before sunrise nor allowed to remain up after sunset.

At "retreat" unset, civilian spectators should stand at "attention" and uncover during the playing of the Star Spangled Banner. Military spectators are required by regulation to stand at "attention" and give the military salute. During the playing of the national hymn at "retreat" the flag should be lowered, but not then allowed to touch the ground.

When the national colors are passing on parade or in review, the spectator should, if walking, halt, and if sitting, arise and stand at attention and uncover.

When the national and state or other flags fly together, the national flag should be placed on the right.

When the flag is flown at half staff as a sign of mourning, it should be hoisted to full staff at the conclusion of the funeral.

In placing the flag at half staff, it should be hoisted to the top of the staff and then lowered to position, and preliminary to lowering from half staff, it should be first raised to the top.

The national salute is one gun for every state. The international salute is, under the law of nations, twenty-one guns.

The days on which the national emblem should be shown at full mast are: Lincoln's Birthday, February 12; Washington's Birthday, February 22; anniversary of the Battle of Lexington, April 19; Memorial Day, May 30; Flag Day, June 14; anniversary of the Battle of Bunker Hill, June 17; Independence Day, July 4; the anniversary of the Battle of Saratoga, October 17; the surrender of Yorktown, October 19, and Evacuation Day, November 25. On Memorial Day, May 30, the flag should fly at half staff from sunrise to noon, and full staff from noon to sunset.

To Hold Convention by Mail.

The Illuminating Engineering Society, New York, has decided to dispense with its usual annual convention this year and to hold in its place a mail correspondence convention. The papers that have been prepared for presentation at the annual gathering are being sent to the members with the request that they be carefully studied and written discussions on them be submitted to the secretary's office.

A man is like a bit of Labrador spar, which has no luster as you turn it in your hand, until you come to a particular angle; there it shows deep and beautiful colors.—*Emerson.*

Telegraph Synchronism.

BY ROMYN HITCHCOCK, ITHACA, N. Y.

Perhaps no other fundamental principle or idea in telegraphy has called forth more individual ingenuity or required more preliminary experimental work of high character in the perfecting of apparatus than continuous synchronism. The more important inventions in this field originated in the United States but found their principal use abroad. Only recently has the principle come into favor in certain applications in this country.

For many years the writer shared in the general opinion unfavorable to synchronous apparatus for commercial business, except for Morse working; but the practical working of a number of printers, the Baudot and others, compelled a more just recognition of the importance and effectiveness of the principle.

It may be of interest to briefly refer to some of the more important inventions involving synchronism. Excluding those forms of apparatus working on the step-by-step principle, such as stock and news tickers, the first successful printer was devised by David E. Hughes, of Kentucky, about 1855, with a continuously revolving wheel. The apparatus was soon modified by Phelps, and the improved machines did good service in the sixties and seventies, when another improvement by Phelps was introduced.

Very different in principle is the Delany multiplex for Morse working, which was taken up in Great Britain where it is still in use. Few persons have any idea of the long and thorough experimental study required for the perfection of this apparatus. What triumph the inventor must have felt when he first succeeded in maintaining the synchronism of his trailers for multiplex Morse! It was a great achievement. But how inadequate the appreciation of his own countrymen in the telegraph service, who could see no advantage in the increased efficiency.

Among printers the Rogers apparatus with "visible synchronism" was remarkable for effectiveness and speed, but it is now quite forgotten and has no such prominence in telegraph history as its original character and merits deserve. The interesting feature of the apparatus is the way synchronism is maintained. Two continuously revolving disks, one at each station, turn in unison of phase and printing is done with six successive line signals for each letter, transmission being automatic with punched tape. The inventor was unable to devise a means to automatically maintain the unison of the disks, but the receiving operator, by gentle hand pressure on the periphery of his disk, maintains the synchronism so perfectly that the apparatus printed, in the presence of the writer, two hundred words in page form in one minute. His only guide is an electric spark which must be kept within certain limits of position on the face of the disk.

The Rogers apparatus was successfully demonstrated in line working; but the built-up letters, although easily read, were not very pleasing, and on the whole the device was not received with favor.

The well-known Murray system, so highly regarded abroad, also originated in this country. It was first demonstrated at the Astor House, New York, and later was tried on the Postal lines, but finally discarded.

The famous Rowland multiplex printer, for some time operated in this country, found its largest commercial development abroad. The synchronism is very perfectly maintained, permitting the simultaneous working of eight printers over one line wire, a marvelous achievement. No doubt the considerable cost of installation and maintenance militated against its permanent adoption in this country.

The latest and most perfect of all printers using synchronism, at least in consideration of commercial effectiveness, is the Western Union multiplex. This apparatus makes the most advantageous use of the line for printer operation.

The synchronograph is an invention deserving of particular attention in this connection, since it utilizes in the fullest degree the speed of alternating current transmission for Morse signals. Although not utilized for commercial business, perhaps there will yet be found a large field for extremely rapid Morse, such as the inventors have so convincingly indicated and as Delany has persistently advocated for many years, particularly for telegraph letters. However this may be, the synchronograph shows the astonishing possibilities of speed on a telegraph wire. The apparatus was devised and experimentally demonstrated by Professor Albert C. Crehore and Lieutenant George Owen Squier, U. S. A., now general and chief signal officer. The plan of synchronous transmission, utilizing half waves of alternating current, which are also the basis of Rowland operation, and the ingenious massless receiver, which rotates the plane of polarization of light, are both deserving of the highest admiration and commendation.

Finally, the wonderful Siemens-Halske rapid-working type printing telegraph should be mentioned. As originally described it gave a speed of 2,700 words a minute. The apparatus has since been modified and the speed of working somewhat reduced, but the original device, extremely complex, indeed, both electrically and mechanically, indicates the speed possibilities of synchronous operation.

In all synchronous apparatus heretofore devised the synchronism is maintained by signals sent over the line. The receiving synchronous element must be specially adjusted to work in unison with the sender. The speed of revolution is not constant but variable.

If a standard, uniform speed should be universally established and maintained exactly, without line signals, it would then be possible to operate synchronously between an indefinite number of stations and to print with a single line impulse for each letter. The writer has recently been granted a patent

(No. 1,224,640), which shows how this may be accomplished. A definite, uniform speed is maintained by means of a pendulum regulation at every operating station. This substitutes a local, definite and invariable speed regulation for a control by line signals.

A pendulum clock, however, is not an exact timekeeper. Even astronomical clocks do not run exactly on meridian time and their slight variations require to be known from stellar observations. Good house clocks have larger cumulative errors of some seconds daily, fast or slow for mean time. Since these cumulative errors are caused by the pendulum rates during the twenty-four hours, it is clear that any regulation of synchronous elements depending upon the time rates of a number of local pendulums would, sooner or later, result in notable disturbances in unison of phase necessary for telegraph operation of a printer.

But during relatively short intervals of time all such pendulums have a rate of oscillation that is practically the true time rate. By disconnecting and immediately reconnecting the pendulum control the cumulative errors of the pendulums are all eliminated and the true time rate is maintained by the elements.

The pendulums are, therefore, not used to measure time, as in clocks, but only for their short periods of practically true time rates. These intervals may be of a few seconds duration or of a few minutes to an hour or more of continuous running of the synchronous elements.

The mechanism described in the patent is only incidental, to indicate how the principle may be applied generally in synchronous working. When a sending key is depressed for any letter or operation, two contacts are made in succession. The first contact effects two distinct purposes. First, it makes a contact for a line signal which starts all the elements in the line circuit in unison of phase of revolution. The starting signal goes over the line only under certain conditions, when it may be required. If the synchronous elements are revolving in unison the starting signal has no effect.

The second operation energizes a line magnet, which establishes the line contact for all printing signals. But the closing of the line circuit by the line magnet does not complete the line circuit. This circuit passes through the second key-contact and can only be established to line when the particular segment of the synchronous element corresponding to the actuated key comes into position.

The line magnet holds its contact until the line current is established, when the contact is broken by the line current. The time of sending the line signals is independent of the time of working the key, as the second key-contact is continued long enough for the synchronous elements to make a complete revolution.

The receiving apparatus is practically a reversal of the circuits of the sender and needs no description.

Concerning the practicability of effecting such close control of unison as is necessary for printing operations at commercial speeds there cannot well be a doubt, although up to the present time no demonstration of the principle has been made by line working. There is no question that the pendulum affords a perfectly reliable means of definite, uniform, speed control. The very perfect motor speed control by line signals in the Rowland apparatus leaves nothing more to be desired in that way. Whatever can be done by line signals can be equally well accomplished locally in the same or in some similar way. The pendulum will send the signals through a local circuit and thus we achieve a universal synchronism which is reliable.

The commercial advantages of operating with universal synchronism are inestimable. For heavy trunk line traffic between great telegraphic centres this system is not to be compared with the Western Union multiplex, for example. It will occupy a field of its own, where, at present, the Morse key is paramount. In England the adoption of printing systems was necessitated because so many thousand Morse operators were called to serve in the army. The practical effect was to show great economies with increased efficiency in the telegraph service. The same result will attend the general use of this much simpler system in this country.

Women and Electricity.

When a woman is sulky and will not speak	Exciter
If she gets too excited	Controller
If she talks too long	Interrupter
If her way of thinking is not yours	Converter
If she is willing to come half way	Meter
If she will come all the way	Receiver
If she wants to go further	Conductor
If she would go still further	Dispatcher
If she wants to be an angel	Transformer
If you think she is unfaithful	Detector
If she is unfaithful	Lever
If she proves your fears are wrong	Compensator
If she goes up in the air	Condenser
If she wants chocolates	Feeder
If she sings wrong	Tuner
If she is in the country	Telegrapher
If she is a poor cook	Discharger
If her dress unhooks	Connector
If she eats too much	Reducer
If she is wrong	Rectifier
If she is cold to you	Heater
If she gossips too much	Regulator
If she fumes and sputters	Insulator
If she becomes upset	Reverser

—*Electrical Experimenter.*

Electric Fan in Fruit Drying.

The drying of fruit for its preservation for future use is being widely practiced in these days of food economy. The United States Department of Agriculture recommends the use of electric fans for this purpose. "The fan method," a bulletin says, "has a marked advantage in that the product keeps cool, owing to evaporation, while it is being dried, thus tending to retain the color and eliminate spoilage."

The Wireless Quadruplex.

BY R. M. TELSCHOW, NEW YORK. (*Copyright.*)

Professor Ignatz Bucknix, an investigator of difficult scientific problems, which he apparently solves with incredible ease, appeared before the board of directors of the International Five and Ten Cent Telegraph Company to demonstrate before that distinguished body his revolutionizing wireless quadruplex. The great corporations, controlling the world's entire means of communication, and always on the alert for improved methods, is directed by an extremely sagacious managing body. When the company began business its rates were ten cents for day messages and night messages were transmitted for five cents. The pressure of night traffic increased to unmanageable proportions, and to overcome this condition the rates were reversed, as a result of which people are again becoming educated to send day messages.

"Gentlemen," quoth the inventor of the four-cornered wireless system, "let me explain to you my new combined aerial and submarine wireless method. There are no wires connecting the two terminals. Two operators in St. Louis and two operators in New Orleans transmit messages simultaneously in opposite directions, one of the messages in each direction traveling through the air and the other through the murky water of the Mississippi River. The depression of the aerial key sends a message skyward via the aerial, the current dividing as in an ordinary Morse duplex. The electrical energy flowing into the artificial line instead of finding a path to the earth, however, is led into a condenser controlled by the submarine transmission key which utilizes the powerful electrical impulses to send messages through water, in this case the Mississippi River."

"Suppose no river is available, Mr. Bucknix?" politely inquired one of the directors.

"Then you can build a canal," jubilantly replied the inventive genius. "The reception of the submarine signals at the distant station is made possible by my ultrasensitive subsea impulse detector which is attached to an iron receiving pipe projecting out into the river. The signals are further amplified for practical purposes by my patented spontaneous analytical microsigaphone."

The directors who had closely followed every word and gesture of the beaming inventor as he traced a lead pencil across the diagrammatical sketch he had unfolded, sat back amazed at the magnitude and vast possibilities of the new invention.

"Do I understand no wires are required for land or sea working?" asked one director of another, incredulously.

"Absolutely none whatever," came the prompt, enthusiastic reply, "isn't it marvelous, Mr. Stocks?"

"Just one word, Mr. Bucknix," hesitatingly emitted the dignified, bewhiskered president and general manager of the International Five and Ten Cent Telegraph Company. "This submarine proposition bears a little further elucidation. You remarked the signals are received on an iron pipe stuck out into the river, an ordinary sewer pipe for instance?"

"Certainly, sir," smiled the inventor.

"Then how are we to prevent the signals from coming in on every other sewer pipe along the river?"

"I have anticipated that," Ignatz averred without a flicker of embarrassment, "it is a very simple matter."

Bending forward and gazing into the tense countenances of the telegraph magnates, Ignatz Bucknix unfolded his pretty little scheme.

"We shall have a law passed compelling everybody but ourselves to construct their sewers of fibre, tile or concrete—all of which are excellent conductors of sewage but absolutely useless as conductors of electricity."

Down near Forest Park stood a large red brick mansion in which Ignatz Bucknix had been domiciled for a year or more. At the present moment great excitement reigned within the building, nobody knowing what had become of the pseudo-inventor. A plain, neatly lettered plate on the front door bore the inscription: "Retreat for the Mentally Deficient."

New York University Benefits from Invention of the Telegraph.

The New York University has received one-third of the residuary estate of more than $1,500,000 bequeathed by Miss Kate Collins Brown, and thus becomes the beneficiary of the invention of the telegraph nearly a century ago by S. F. B. Morse in the old University Building in Washington Square, New York.

Perry McDonough Collins, the uncle from whom Miss Brown inherited her fortune, conceived the idea of an overland European telegraph system in 1856, received the concessions, but never carried out his plan because of the successful laying of the Atlantic cable a few years later. But the sale of his concessions to the Western Union Telegraph Company was the making of the fortune part of which now goes to New York University.

After conceiving the idea of wires to connect all the commercial units of the world, Mr. Collins studied the resources of the Pacific Coast, especially in connection with the coast of Asia. He planned to extend his wires along the coast and to cross Siberia to Western Europe, thus making an all-land connection except across Bering Strait and the English Channel. The Amur River was fixed by Mr. Collins to be the penetrating wedge by means of which American commerce was to open up northern Asia. After conferring with President Pierce, Secretary Marcy, and the Russian Ambassador in Washington, Mr. Collins was appointed as commercial agent of the United States for the Amur River on March 24, 1856. But his ideas never materialized, because of Cyrus W. Field's completion of his Atlantic cable. However, Mr. Collins had valuable concessions, which were the nucleus of the fortune.

The Pupin Coil.

"Although the invention of the 'pupinized' telephone line was made fifteen years ago, and is often mentioned in papers relating to electrical matters," says Prof. F. B. Crocker, in the *Scientific American,* "it has rarely, if ever, been described, except in very technical terms, although it is a matter of great general interest, as by this invention a problem of great practical importance is solved in an entirely scientific manner; in fact, it is a noteworthy example of obtaining great practical results from purely *a priori* reasoning. The problem was conceived, and largely worked out, by theoretical calculations before any experiments were made, even in the laboratory. In spite of its great importance and peculiar interest, the principles upon which this invention is founded and its real nature are often misunderstood, even by those otherwise well informed in electrical matters, and consequently the following description is presented in as popular language as the subject permits.

"This invention was publicly described to the American Institute of Electrical Engineers by Professor Michael I. Pupin in May, 1900, but was conceived and developed by him some time earlier. The principal object of the invention is to conserve the amplitude and form of the electrical waves corresponding to human speech when they are transmitted to considerable distances by conductors, especially underground and submarine cables. In this way the distance at which intelligible telephone conversation may be carried on is increased. The Pupin invention of 'loaded lines' is often supposed to depend upon the neutralization of their electrostatic capacity by introducing inductance coils along such lines. This principle does apply to his pioneer work in electrical resonance, and in tuning circuits to make them responsive to a particular frequency of alternating current. But it does not, however, apply to 'loaded' or 'pupinized' conductors. Indeed, the condition of resonance is avoided in the latter case, and a relatively large amount of inductance may be advantageous, especially for long lines, provided excessive resistance, hysteresis, and eddy current losses are not introduced at the same time.

"The simplest analogy to Pupin's invention is the fact that a projectile must have considerable mass in order to overcome the mechanical resistance of the air and travel a long distance. Similarly, a conductor must have electromagnetic mass, or inductance, in order that an electric impulse or wave may overcome the electrical resistance and travel a long distance. It is necessary in the case of the conductor to distribute the inductance along the path of the electric impulse or wave, hence the phenomenon is more closely analogous to that of a long cord stretched between supports, which must have distributed mass, that is to say, it must be a fairly heavy cord in order that mechancial vibration or waves may be propagated to a considerable distance along it. In the case of the electrical conductor, for example, a telephone line, it is not convenient to distribute the electromagnetic mass or inductance uniformly, so it is introduced in the form of inductance coils placed at certain intervals throughout its length. This corresponds to the mechanical fact that a light cord with distributed weights attached to it is practically equivalent to a heavy cord. Pupin determined by calculation and by experiment that the distance between the coils, like the distance betwen the weights, must not exceed a prescribed amount in each particular case. That is to say, there must be at least a certain number of coils per wave length in order to approximate a uniformly distributed inductance, otherwise they may do more harm than good. Moreover, the shortest wave length must be considered. In telephony the highest frequency necessary to transmit articulate speech is about 1,200 waves per second. This corresponds to the upper harmonics of overtones in some of the consonant sounds. Hence the wave length at this frequency is calculated for the given conductor, together with the loading coils, which have a certain total resistance, capacity, and inductance that are assumed to be uniformly distributed. As demonstrated by Pupin, in a conductor having not less than eight or ten of his coils per wave length, this assumption is approximately correct. To arrive at these facts, Pupin devised new mathematical methods, and solved the various problems in a most thorough and exact manner.

"Pupin further showed how to design the coils for loading lines in order to obtain maximum inductance with minimum resistance, hysteresis, and eddy current losses. In fact, the practical success of his system requires that these losses be reduced to a minimum, and this was accomplished by ingenious and careful construction.

"The Pupin 'loaded line' permits higher voltage to be applied to it, whereby the electrical waves may be transmitted to a correspondingly greater distance. In the transmission of electric power it is sufficient to use 110 to 220 volts to supply motors locally. For long distance electrical pressures are raised to 100,000 volts, or even higher. In an analogous manner higher voltage applied to 'pupinized' lines increase the distance at which telephonic communication may be practically carried on. If the voltage were raised on an ordinary unloaded line the current would be proportionally increased and the losses would rise in even greater proportion. The losses would also be aggravated if resistance were introduced to limit the current. On the other hand, the introduction of inductance coils adds to the reactance of the line so that the current is not excessive, even with a higher voltage. This reactance simply stores the energy momentarily and returns it, but does not increase the losses.

"The industrial application of 'pupinized' lines has been remarkably successful and important. In the United States the American Telephone and Telegraph Company purchased Pupin's inventions in this field, and has 'loaded' many thousands of miles of overhead and underground telephone cables with Pupin coils. In many cases the cost of the large conductors, as well as their excessive weight and bulk, would be practically prohibitive, if it were not for the saving in the size of wire that is secured by Pupin's invention. There is a practical limit to the distance to which speech can be successfully transmitted by underground or submarine cables. For distances of fifty miles or more copper conductors of such large size would be required that their cost would be so high, and they would require so much expensive insulation to cover them, that the investment would become excessive. Moreover, the very object of using large conductors is to reduce their resistance and thereby make up for the relatively high electrostatic capacity of underground or submarine cables. At the same time these large conductors would have correspondingly greater electrostatic capacity, which calls for still lower resistance, and so on. In short, the remedy itself increases the trouble so that still more remedy is needed, which further adds to the difficulty, and the situation appears to be hopeless. Fortunately, the 'pupinized' underground or submarine cable may have conductors of moderate size, because their resistance does not have to be reduced to an extremely low value to make up for the high electrostatic capacity. The latter is practically inevitable when conductors are laid underground or under water, due to the condenser effect between the conductor and the earth or water, as well as the sheath usually applied to such cables. In accordance with the Pupin invention the electrostatic capacity is not neutralized but overwhelmed by introducing large inductance. Hence the conflict of conditions as described is avoided."

Lightning.

When clouds are rapidly formed by air currents rising into the air, enormous quantities of electricity are produced. We do not know exactly how it is produced. The latest theory, that of Dr. Simpson, explains the electrification as resulting from the splitting of rain drops into smaller particles as they tend to fall through a rapidly rising current of air. In some way clouds do become highly charged with electricity. Sometimes they are positively charged and sometimes negatively charged. When two clouds or a cloud and the earth are at sufficiently great difference of potential the resistance of the intervening air is overcome and a discharge takes place, producing the common phenomenon of lightning. Sir Oliver Lodge calculated that a flash of lightning one mile long is probably due to a difference of potential of 5,000,000,000 volts, but it is generally thought now that this figure is too high. Trowbridge has found that a difference of potential of about 25,000 volts between battery terminals will give a one-inch spark through air.

The duration of a flash of lightning is usually under 1/50,000 second and may be only 1/1,000,000 second. Because of persistence of vision we apparently see the flash for a longer time. According to calculations made by Lodge, a discharge from a cloud ten yards square, fully charged, at a height of one mile, liberates 2,000 foot-tons of energy. This energy is enough to warm two and one-half quarts of water to the boiling point and then change it to steam in a trifling part of a second. Such intense heat warms the particles of air to incandescence and is the cause of the flash seen. Heated air conducts electricity better than cold air, so at times other flashes will follow in the path of the first one before the air has become cold. These multiple or oscillating flashes may continue for 1/1,000 to 1/200 second, but altogether they apparently make but one flash to the eye.

When this energy heats the air in the path of the lightning discharge it causes sudden expansion with explosive violence and when the expanded air cools and contracts a vacuum is formed, into which air rushes again with implosive force. This illustrates the production of thunder. One part of a lightning flash may be a mile farther away from you than the nearer part. The thunder from the more distant part will reach you about five seconds later than that from the nearer part. Thus, while a flash may be instantaneous, the thunder which you hear may be of considerable duration. Thunder from several flashes may unite. Thunder may be reflected by one or more clouds. In these ways the rumblings, characteristic of thunder, are produced.

Electric Clock Driven by Earth Currents.

This clock, says an exchange, unlike an ordinary timepiece, is not actuated by either weights or springs. The motive force is a current of electricity obtained from a pair of plates buried in old Mother Earth, and which are connected with the clock by wires.

The current is applied by means of an electromagnet direct to the pendulum, so that the pendulum drives the clock instead of the clock driving the pendulum, as is the case where weights or springs are used.

The current is reversed at each swing of the pendulum by an automatic switch, and this switch is so adjusted as to prevent the pendulum being moved in either direction beyond a given point. It is the application of this principle which secures correct time and overcomes any slight variation in the strength of current.

KEYHOLE FINDER.—An Ohio man has invented an electric keyhole illuminator for those returning home from lodge. By pushing a button a small electric light is flashed upon the keyhole. But how is a fellow going to find the button?

Hon. H. E. Marquardt, mayor of Wausau, Wis., in remitting to cover his subscription for two years writes: "Although it has been more than twelve years since I severed my connections with the telegraph service, I am nevertheless still interested in the many new features that are advanced from year to year to improve the telegraph, and my former relations with the service. After leaving the telegraph I took up life insurance underwriting for one year, but since that time I have been in the service of the City of Wausau, ten years as comptroller and the second year as mayor. I extend to you and the AGE my good will and wish for you much greater success in the future than you have had in the past."

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

THE DYNAMO-ELECTRIC MACHINE.

It is easy to construct dynamo-electric machines (more properly called electric generators), having an electromotive force at least equal to 100 gravity cells, the internal resistance of whose armature is but a fraction of an ohm, and thus it is possible to feed from one machine several hundred telegraph wires without perceptible variation in the current strength furnished. It is this feature, among others, which gives the generator, as a source of electromotive force in telegraphy, so decided an advantage over gravity or other forms of chemical battery in offices where many wires are operated.

In practical telegraphy the lengths and resistances of circuits vary materially, so that when gravity battery is used as the source of electricity the number of cells of which a battery is composed is usually governed by the length and resistance of the circuit to which it is to be assigned. For instance, a single wire from New York to Boston, 300 miles, might require seventy-five cells; one New York to Buffalo, 430 miles, 150 cells; one New York to Philadelphia, 50 cells, while quadruplexed circuits between the same points may require 150 cells, 350 cells and 125 cells, respectively.

One method of arranging generators to furnish varying electromotive forces is shown in Fig. 1, which illustrates the plan of the original device for that purpose, as designed by the late Mr. S. D. Field.

The field magnets are indicated by the letter M in each case; the armatures by *a*. The machine E is called the "exciter." It is self-exciting. Its function is to excite the field magnets of the machines A, B, C, D, which furnish the current for the wires. The circuit from machine E simply extends to and through the field coils of the other machines and returns to E. This machine is wound in what is termed "series"—that is, the field magnet coils are connected directly in the external circuit and with the armature coils. Each of the machines A, B, C, D, is capable of developing an electromotive force of about eighty volts, and, therefore, as one machine is connected to the other in series in the same manner as chemical battery cells might be connected, the total electromotive force developed by the four machines is 320 volts, as indicated in the diagram. The circuit of the machines A, B, C, D, is from the earth E^1, thence to the lower brush of A, through the armature to the upper brush, thence to point X, where part of the current is diverted to the line wires of low resistance (first passing through an artificial resistance R). The other portion of the circuit leads to the lower brush of machine B, at which machine the E. M. F. is increased to the extent of eighty volts, making 160 volts. From the junction X^1 a wire leads to the switchboard to furnish current to such line wires as require 160 volts potential. The circuit, then, from X^1 passes through in the same way the armatures of C and D, still further increasing the E. M. F., which is utilized as in the cases of A and B.

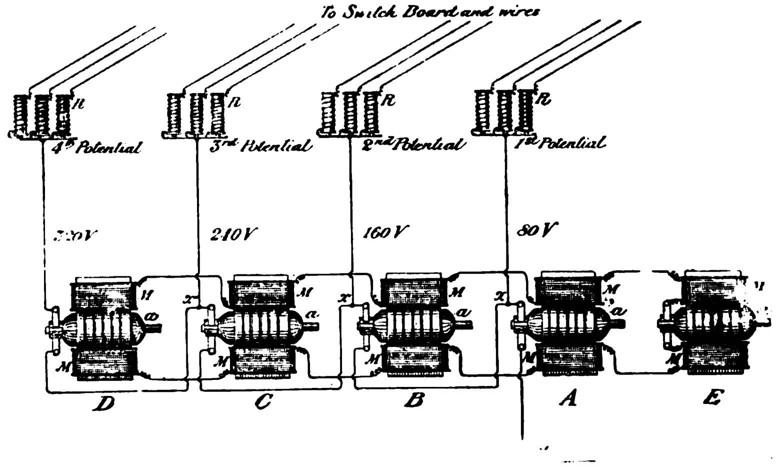


FIG. 1.—FIELD ARRANGEMENT OF GENERATORS IN SERIES.

(To be continued.)

QUESTIONS IN TELEGRAPHY.

Why is it possible to feed many more wires with current from electric generators than it is from a chemical battery?

How are generators arranged to furnish varying electromotive force?

Telephony.

The operation of the repeating coil is as follows: The continuous current flowing out from the battery through one pair of windings of the repeating coil, line and telephone set is varied in strength by the varying resistance of the transmitter caused by a person talking into it. This varying strength of current, flowing through one pair of windings of the repeating coil causes a corresponding variation in the magnetic strength of its iron core. This varying magnetic strength of the core induces a correspondingly variable current in the second pair of windings of the repeating coil. This current in turn flows through the second line and, superposed on the continuous current from the battery, produces variations in the current flowing through the second line and, through the induction coil in the listener's receiver.

Repeating coils are also extensively used for separating, electrically, lines or sections of lines which for certain reasons cannot be joined directly; for adapting one line for simultaneous telephone and telegraph use; for equipping two parallel lines to act as a third line—the so-called "phantom" line—and for a large number of special purposes. Their action in repeating speech current is, however, the same in all cases.

(To be continued.)

Radio Telegraphy.

TRANSMITTING CONDENSERS.

There are many types of condensers using glass as the dielectric, such as plates or jars covered with foil or plated with copper. When these condensers are used at high potential, such as 25,000 volts or more, there is developed at the sharp edges of the foil or plating a discharge (sometimes called brush discharge), which spreads out over the surface of the glass, is accompanied by a hissing sound and considerable heating of the glass close to the edges, and, in a dark room, shows a pink light at the edges. The puncturing of the glass and the breaking down of the condenser often takes place close to the edges, due probably to the brush discharge and the local heating of the glass. These discharges represent losses which, in part at least, can be prevented by covering the edges of the foil with an insulating coating, such as asphaltum, and more completely by immersing the condensers in an insulating oil, such as castor oil, etc.

The capacity of these condensers and the voltage which they can withstand depend so much on the quality of glass, the manner in which it was annealed, its thickness, etc., that it is impracticable to give figures except for condensers that have actually been tested. The capacity of one glass plate about three-sixteenths of an inch thick and with the foil fifteen inches square is about 0.0020 to 0.0025 microfarad. The capacity of a jar with glass one-eighth of an inch thick, four and three-fourth inches in diameter, and height of foil of ten inches, is about 0.002 M. F. In the case of a good grade of plate glass about three-sixteenths of an inch thick, free from scratches, bubbles, etc., a potential of 20,000 volts, peak value, can be safely used.

QUESTIONS IN RADIO TELEGRAPHY.

What is the function of a condenser?

What is the most efficient type of condenser, and how is it constructed?

Why is the air in an air-tight tank containing a condenser kept at a high pressure?

In radio work are dielectrics of glass used in the makeup of condensers?

The Western Union Multiplex.

ALPHABET.

The code used in this system is an equal letter, five-unit code; that is, each signal consists of five units or current impulses, and all signals require the same amount of line time for their transmission. This is true if the signal is that of a letter, a figure, or a signal which is utilized to perform some other function at the receiving end. Referring to Fig. 6, it will be noted that all of the signals are shown of equal length and that each consists of five units.

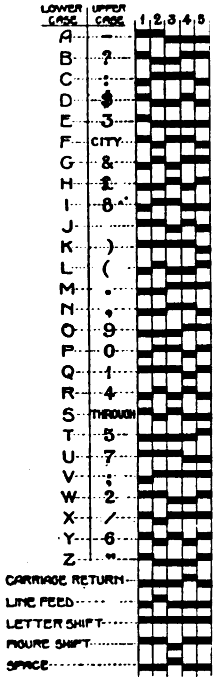


FIG. 6.—THE ALPHABET.

Considering the black above the dotted line as positive and below the dotted line negative, we see that the letter "A" consists of units 1 and 2 positive, and units 3, 4 and 5 negative; that letter "B" consists of unit 1 positive, units 2 and 3 negative, and units 4 and 5 positive, and letter "C" consists of unit 1 negative, units 2, 3 and 4 positive, and unit 5 negative, and so on. In a five-unit code, assuming that each unit is represented by a pulse of positive or negative current, we have available thirty-one combinations, which are sufficient for all the letters of the alphabet and the functions—carriage return, line feed, letter shift, figure shift, and space. The various figures and additional functions are obtained by means of another case, as is indicated. Thus the signals for A, B, C, etc., can be made to print -, ?, :, etc., by preceding these signals by the figure shift signal. Before returning to letters, it will then be necessary to send the letter shift signal, which will cause the printer to proceed in the lower case. As just pointed out, it is necessary to employ signals for figure shift and letter shift, in order to obtain all the letters, figures and symbols required. In addition to this, the page printing feature requires signals to lift the paper vertically and return the carriage for a new line. The transmission of these extra signals over the line occupies line time, and this loss of time has been found to average about ten per cent. of the working time, for ordinary telegraph traffic. In other words, the code employed in this system may be considered to average 5.5 units per character so far as line transmission is concerned. Analyzing the Continental Morse code as used in Wheatstone working on the same basis, we find that the signals for the various letters or figures occupy different lengths of line time. From an investigation of actual telegrams, it has been found that the Continental Morse code requires an average of 9.08 units per letter. As regards the economy of line time, the five-unit code has an advantage over the Continental Morse code as 9.08 is to 5.5. This means that if the maximum speed of transmission over a telegraph line is 6,000 units or impulses per minute, these impulses may form 660 letters in the Morse code and 1,090 letters in the five-unit code used in this system, an advantage for the latter in line transmission economy of 65 per cent. On long aerial lines and on lines which consist wholly or partially of underground cable conductors, the advantage to be derived from the use of the five-unit code is considerable. On short lines where the permissible line speed is well beyond that of the apparatus or the requirements of the traffic, the shorter code will permit of duplex operation with a greater inaccuracy in the duplex balance. This means that the system can be worked duplex under less favorable weather conditions, with less supervision, than could a system using a code less economical of line time. Fig. 7 illustrates the economy of the five-unit code as compared with the Continental Morse code used by the Wheatstone. In the upper line are shown the current impulses necessary to send the words "London, New York, Paris" by the Continental Morse. In the lower line are shown the current impulses required to send the same words with the five-unit code. Whereas the Continental Morse requires 192 units of line time to transmit these three words, the five-unit code requires only 100. This, however, is an isolated case, and does not give a true comparison of the transmission economies of the two codes when used for ordinary telegraph traffic. This is particularly true, since the transmission of these words requires none of the special function signals, such as figure shift, letter shift, carriage return, paper lift, etc.

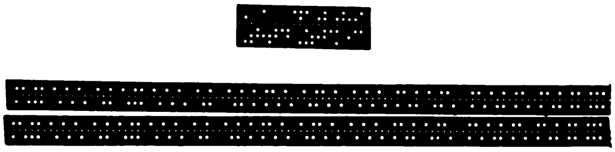


FIG. 7.—ECONOMY OF FIVE-UNIT CODE.

(To be continued)

Shop Talk.

BY THE OBSERVER.

How often we hear the remark: "Isn't it odd that no matter how carefully one tries to keep up his 'log,' you never can find just what you want when something comes up?"

Now there is a whole lot of truth in this, for I daresay, that there is hardly any traffic and regulation man who has had a few years' experience that has not been caught in this dilemma.

However, to one that watches his log carefully these awkward situations will be few and far between. By "watching the log," I mean that we must not write too much, or not enough, but to inscribe anything that affects a circuit. First, the exact time the trouble came in, the location, nature and cause, time it was removed, etc. Now, if that is done there is absolutely no chance to be caught unawares, as far as that particular problem is concerned, but did you notify all interested so that they might protect their business, and is it not a fact that you might have made a patch here or there, but by failing to do so, you have no defense?

The harmful effects of each local trouble may be alleviated if the remedy is properly applied. Such will have to be mastered by the party in charge because the dispatcher, unless invoked, will have no knowledge of the case.

I wish to state right here that unless you wish to borrow a circuit from the dispatcher, you should not bother him; but at any time you feel helpless, tell the dispatcher, or the nearest wire chief and you will either be helped at once, or comforted with the knowledge that you have done all that is possible. Now please understand when I say the dispatcher should not be bothered that I am referring to way wires, and more especially those where there are no trunk wires on the route. A study of conditions will in many cases suggest a way out.

Now as regards the log on duplexes, etc. If asked to ride for any specific trouble, be sure to write the time you sit in; remain and and carefully watch it a reasonable time, and when you leave, note the time and in a few words, the conditions. This refers to the fact that you see nothing wrong, but if there is anything wrong, never leave until it is righted, or that your particular part of it is correct. Do not overlook the instructions that you are not to forsake a circuit until the terminals are together.

This brings up a question. Suppose there are repeaters at B, C, and D, the terminals being at A and E, and the trouble reported between D and E. Should men at B and C remain constantly at their sets, neglecting other urgent work? Most assuredly not. Go do the other work, but return to the particular circuit, and stick to it until the trouble has been removed, or the circuit pronounced "short." In this manner you can fulfil the instructions, maintain a log that will be complete and you need have no fear of being able to explain all when called upon.

(To be continued.)

FOR CLEAR
TRANSMISSION

EDISON PRIMARY BATTERY DIVISION
THOMAS A. EDISON, Inc.
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HALL SWITCH AND SIGNAL CO.

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MANUFACTURERS OF THE

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THE UNIVERSAL SELECTOR
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KERITE INSULATED WIRE & CABLE COMPANY

NEW YORK CHICAGO

DURABILITY RELIABILITY

THE RAILROAD.

Special Meeting of Railway Telegraph Superintendents in Chicago, November 22.

Mr. M. H. Clapp, president of the Association of Railway Telegraph Superintendents, has called a special meeting of the Association to be held in the East Room of the La Salle Hotel, Chicago, Thursday, November 22.

At this meeting it is proposed to consider the following subjects:

1. Brief progress reports from the different special committees. With the view of giving these committees an opportunity to meet and prepare their reports, the La Salle Hotel has assigned the East Room for the Association's use not only on November 22, but on November 21.
2. Conservation of telegraphing and telephoning in connection with both commercial and railroad wires. A special committee consisting of Messrs. Cellar, Chenery and Keenan has been appointed to consider and report to the special meeting on this subject.
3. Shortage of operators and plans for schools to teach operators. Special Committee No. 7, Railroad Message Traffic, Mr. F. T. Wilbur, chairman, will consider this subject and report to the special meeting.
4. Emergency use of wire facilities in operation of railroads to meet the present war situation. It is desired that the membership consider this subject and be prepared to present to the meeting any emergency use of facilities that have been made to meet the present situation.

Mr. W. L. Connelly, Gibson, Ind., is secretary of the Association.

Self Recommendation.

Mr. A. J. Stone, vice-president of the Erie Railroad, has issued a notice to the employes of that company, including telegraph operators, to write letters to their superintendents giving their past experiences in the company's service and naming any higher positions they feel qualified to fill. The object is to fill the positions of superintendents, assistant superintendents, train and yard masters, train dispatchers, master mechanics and road foremen.

Mr. N. W. Jones, superintendent of the Philadelphia, Reading and Pottsville Telegraph Company, and of the Philadelphia and Reading Railway Company, has been appointed superintendent of the New York division of the Reading Railway Company, with headquarters in Philadelphia.

Mr. Llewellyn D. Shearer has been appointed superintendent of telegraph of the Philadelphia, Reading and Pottsville Telegraph Company and the Philadelphia and Reading Railway Company, to succeed Mr. N. W. Jones. His office will be in Reading.

Mr. A. W. Flanagan has been appointed general foreman, southern district, Southern Pacific Lines, with headquarters at San Francisco, vice W. S. Fender, deceased, and Mr. G. W. Palmiter has been appointed general line supervisor, with headquarters at the same point, to succeed Mr. Flanagan. Mr. E. L. King is superintendent of telegraph of the Southern Pacific lines.

George A. Beach, aged eighty-one years, an old-time operator associated with Mr. Thomas A. Edison at Port Huron and vicinity in the early days, died recently in Chicago. From 1870 to 1890 he was superintendent of telegraph of the Wabash System, with headquarters at Toledo. Mr. Beach was a brother of the late Frank G. Beach, general manager of the Central Union Telephone Company at Chicago, and, previous to his advent in the telephone industry, superintendent of the Atlantic and Pacific Telegraph Company at Cleveland, Ohio.

MUNICIPAL ELECTRICIANS.

Macon, Ga.—A new fire alarm and police telegraph system has been installed in Macon, Ga.

INDUSTRIAL.

How to Improve Each Shining Hour.

There are several thousand operators in New York City and vicinity, many of whom would be glad to know how they can best utilize their spare time. There is no better way than to take up a course of study in the electrical trade. This gives the student knowledge and capital that is good at any time, anywhere, and puts him on the road to future betterment.

An excellent institution for the teaching of practical electrical work is the New York Electrical School, 45 West Seventeenth Street, where the young man does the actual work of wiring and installation while he studies. This school makes "practice" its principal feature in teaching, while at the same time enough of theory is imparted to the student to enable him to understand the whys and wherefores of the actual work.

Diaphragm Sounders.—The Railways Labor-Saving Device Company, Davenport, Iowa, whose advertisement appears on another page of this issue, continues to report sales of the diaphragm telegraph sounder among individual operators at small stations, because it does away with the care of local batteries. The diaphragm sounder is attached to the relay, which is a strong point in its favor. Operators can safely invest in these instruments, knowing that they can be used without consulting the engineering department. No one likes to take care of a local battery.

OBITUARY.

Luther A. Rose, one of the veterans of the United States Military Telegraph Corps, died at Davenport, Iowa, September 12.

E. T. Greene, aged eighty-two years, an old-time telegrapher, died in Galena, Ill., October 2. He was manager of the Western Union office in Galena during the Civil War.

Electrolysis.

(*Continued from page* 442, *October* 1.)

ELECTROLYSIS SURVEYS.

GENERAL. Electrolysis survey is the term applied to an investigation made for the purpose of determining the condition of a cable plant with reference to the possibility or existence of electrolytic corrosion.

The term "survey" has a wide range of meaning, as it may signify anything from a few tests to a very complete study of a cable and railway system and the conditions in each of them. In general, however, surveys can be classed as either Preliminary, Routine, Complete, or Re-surveys.

Preliminary surveys are to determine simply whether a cable, which has not been investigated previously, is safe or in danger of corrosion. At every second or third manhole the cable is inspected for any visible evidences of corrosion, and electrical tests are made to determine whether the cable sheath is carrying current and in a "positive" or "negative" condition with reference to earth and to other cable, pipe or railway systems, if any should be near.

Measurements of current in the cable sheath are made by observing the fall of potential over a measured length of cable and calculating the current from the known resistance of this length of sheath. Such tests are usually made with a millivoltmeter.

Potential measurements are made by means of a voltmeter. The potential is read directly in volts and the direction of potential determined from the direction of deflection of the instrument needle.

When a "Preliminary" survey shows that a cable is corroded or in danger of corrosion, a "Complete" survey must then be made to determine the cause of the trouble and the kind of protection needed. The magnitude of this survey will depend on the severity of the conditions and the difficulties encountered in determining remedial measures and installing them.

ROUTINE SURVEYS. Since electrolysis conditions are never constant, but change constantly with changes in the cable or railway system or in other cable or pipe systems, it is necessary to test a cable at fairly frequent intervals in order to insure that a formerly safe condition has not changed to one of danger.

The character of Routine surveys is the same as that of Preliminary surveys, just described.

Complete surveys are undertaken for the purpose of eliminating dangerous conditions that have been disclosed by Preliminary or Routine surveys. It often follows, therefore, that such surveys require very extensive study of the electric railway system which causes the trouble and also of the electrolytic condition of all cable and pipe systems in the vicinity. Before efficient mitigative measures can be decided upon, it is usually necessary to determine approximately what specific condition is responsible for the presence of current in the cable sheath and in what manner this current is endangering the cable.

A brief outline of the data required for a complete survey and the tests to be made is given in the paragraphs following:

RE-SURVEYS. Re-surveys are really nothing but continuations of complete surveys. They consist chiefly of tests made for the purpose of determining whether mitigative measures have been successful. Consequently the tests on the cable are largely composed of potential and current measurements such as made in Preliminary surveys. In general, Re-surveys also include additional tests on the cable or railway system to determine what other changes have resulted from the mitigative measures applied. Such tests may include measurements of current in drainage connections, potential tests on a railway track and return system, etc., depending on the nature of the changes that have been made.

DATA REQUIRED ABOUT RAILWAY, PIPE AND CABLE SYSTEMS. After having first checked up the potential conditions of the cable and the current flowing in the sheath, as disclosed by the Preliminary tests, the next step is to collect fairly complete data about the electric railway system—the tracks, return circuits, generating and substations, load characteristics, etc. Particularly important points are the location of negative feeders, taps to rails, insulating joints in trolley and rails, and the general condition of the track bonds and return system. In surveys of trunk cables all railway systems within several miles should be considered, but in cities and towns it is usually unnecessary to take into account systems of tracks which are more than a mile or so away.

Besides the electric railways, it is also necessary to consider any foreign pipe or cable installations in the near vicinity of the cable. Such systems constitute very important factors of the survey, as they may be the immediate cause of introducing current to the cable or causing it to leave. It is assumed, of course, that all pertinent facts regarding the cable system being investigated have been collected, such as location of laterals, existing drainage connections and insulating joints, the types of construction used over bridges, etc., and the records of past electrolysis failures or surveys.

TESTS REQUIRED. The potential and current measurements on the cable have been mentioned. These potential tests must not only show the potential of the cable with reference to earth, but also the potential with reference to railway tracks, water and gas pipes, metal bridges, manhole frames, and other cables in the same or different conduit; also in the case of existing insulating joints the potential across the joint and to earth on each side of the joint.

A study of these test results, together with the data that has been collected about the various track and underground systems, will first show just what portions of cable are liable to corrosion and then should indicate what are the disturbing factors and what influence the different cable, track and pipe systems have on each other.

Before protective measures can be decided upon, however, it will usually be necessary to make additional tests between the cable and disturbing system, and also on the railway system itself. For example, in order to determine the source of stray current in a cable sheath, potential tests may be required between the cable and distant power stations or tracks, made simultaneously with potential and current readings on the cable. Such tests are especially useful where there is a network of tracks and underground structures, as in cities, or where the railway system is supplied by two or more power stations in parallel.

The potential gradients in the tracks and the general condition of the track bonds and return circuits may be obtained from potential readings made over different sections of track—both short sections and long. Readings from pipe and foreign cable systems to tracks and also to the cable system will show, when supplemented by simultaneous tests on the cable itself, what influence such systems have on the situation.

When drainage connections to tracks or bus-bars are considered, it is advisable, if possible, to provide a temporary drainage wire and make observations of current flow in the wire and its effect on the cable system. Such tests show whether the proposed drainage will be practicable, and also furnish data for determining what size of wire should be installed.

(To be continued)

Useful Wire Table.

Wiring tables are very plentiful but most of them have so much condensed information that many ambitious electrical students sometimes shudder when they contemplate such an array of figures.

The following table for copper wire is simple and will be found useful by students and all practical telegraph and telephone or any other kind of an engineer who has to do with electrical wires. It gives much information in small compass, and is worth cutting out and carrying around with one in the pocket.

B. & S. Gauge	Diameter, in Inches	Feet, per lb.	Ohms, per thousand ft.
0000	.460	1.56	.048
000	.410	1.97	.061
00	.365	2.49	.076
0	.325	3.14	.096
1	.289	3.95	.122
2	.258	4.99	.153
3	.229	6.29	.194
4	.204	7.93	.245
5	.182	10.00	.307
6	.162	12.61	.388
7	.144	15.90	.491
8	.128	20.05	.621
9	.114	25.28	.783
10	.102	31.38	.979
11	.091	40.20	1.229
12	.081	50.69	1.552
13	.072	63.91	1.964
14	.064	80.38	2.485
15	.057	101.63	3.133
16	.051	128.14	3.914
17	.045	161.59	5.028
18	.040	203.76	6.363
19	.036	257.47	7.865
20	.032	324.00	9.942
21	.028	408.56	12.53
22	.025	515.15	15.90
23	.023	649.66	19.93

In order to ascertain the resistance of copper wire per mile, instead of per 1,000 feet, as given in the table, divide the figure given per 1,000 feet by 1,000 and multiply the quotient by 5280 (the number of feet in one mile), which gives the resistance of one mile of the wire under consideration. For example, what is the resistance of one mile of No. 4 copper wire?

One thousand feet measures .245 ohms; .245 divided by 1,000=.000245 (resistance of one foot); .000245 multiplied by 5,280=1.29+ ohm.

The same rule applies to all other sizes.

How Rubber is Obtained.

The rubber gum used for insulation purposes comes from practically all parts of the tropics, but as the Para rubber, which is the best grade, is produced principally in the province of that name in the upper Amazon region of South America, it is naturally thought of as a product of that country. Strictly speaking, it is not derived from the sap of a tree, as the rubber milk in which the globules of the gum float is quite distinct from the sap and is apparently not essential to the life of the plant. It could probably be removed in moderate and regular quantities without seriously damaging the tree, but in practice it is necessary to cut through the bark to obtain a flow of this milk. The milk with this peculiar quality comes from a large number of species of trees. Some are small plants, others are shrubs and others are giants 150 feet high. The typical tree, however, is about sixty feet high and six or eight feet in circumference.

The trees are tapped by natives as soon as they have attained a circumference of eighteen to twenty-four inches, and if the process is carefully carried on the trees may live for many years. The methods of collecting rubber are very crude, as they have been developed by a half-savage people, and in many cases they are very wasteful. The work of tapping begins at daybreak, as the milk is said to flow more freely in the morning hours. The tree is cut by striking in an upward direction with a small axe and a cup is immediately placed under the cut and held in place by a small quantity of soft clay. The milk slowly flows from the cut into this cup. Similar cuts are made around the tree at a height of about six feet from the ground and the next morning the operation is repeated, the cuts being made six to eight inches lower on the trunk. This process is continued day after day until the ground is reached. At the end of each day the natives pour the milk out of each cup into a gourd, in which it is carried to a camp to be coagulated. When the fresh juice is exposed to the air in a thin film, it soon dries and hardens into elastic layers of a brownish-yellow gum. This process is hastened by the smoke of a smoldering fire or other equally crude methods.

Telegraph and Telephone Age

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NEW YORK **Publisher**
ESTABLISHED 1883
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$1.00 for six months. 50c for three months

No doubt you are aware that TELEGRAPH AND TELEPHONE AGE is the only publication in this country devoted exclusively to the interests of the telegraphs, the telephones, wireless telegraphs and submarine cables. In the pages of this magazine are recorded the activities of the different societies, associations, clubs, etc., both social and official, connected with the various companies.

Our correspondents and agents all over the United States and Canada and throughout the world secure for us the facts of all the important events connected with these industries, so that we are enabled to present them to our readers in a clear and concise manner.

The value of the magazine does not end here, however. We have special articles for the thinker; those who wish to advance themselves in their respective lines of employment.

The following partial list of contents gives a slight idea of the advantages to be gained by a subscription to this paper. These articles appeared in TELEGRAPH AND TELEPHONE AGE during the year 1916.

They, however, do not begin to represent all of the items that found space in these columns during the period mentioned. The twenty-four issues constituting the output for the year 1916 make up a book of over eight hundred pages of the most interesting electrical history covering the telegraph, wire and wireless; the telephone, the railroad telegraphs and the fire and police telegraph systems. The articles comprise:

Voltmeter Testing, W. W. Boes; New Universal Shunt, H. W. Brown; The Problem of Transposition Systems, M. H. Clapp; Tying and Splicing of Copper Wire, W. H. Collins; Testing Quadruplex and Duplex Instruments, M. M. Davis; Early Wireless, L. Derrick; Ohm's Law, J. B. Dillon; Manipulation in Wireless Telegraphy, C. Dreher; Method of Locating two Crosses Between the Same Pair of Wires, A. J. Eaves; Printer Systems, H. A. Emmons; Observation and its Relation to the Repeater Man, A. H. Frederick; Troubles of a Trouble Man, O. C. Greene; First American Telegraph Company, J. E. Hall; Modification of Varley Loop Test, H. V. Lewis; Handling of Bridge Polar Duplex, C. J. McKee; Time System for Telephone Operating Rooms, J. S. Miller; Monitorial Dictaphone Observations, F. D. Murphy; The Dry Cell and How It Is Made, J. H. Schmidt; Combined Telegraph and Telephone Operation, J. F. Skirrow; The National Electrical Code and Its Value to the Municipal Electrician, R. A. Smith; Temperature Co-efficient of the Varley Bridge, J. W. Snyder; Wire Testing an Exact Science, R. M. Telschow; First Postal Underground Wires in Washington, C. F. Thompson; Telephone Repeating Coils, E. B. Tuttle; The Electromagnet, C. R. Underhill; Is the Telephone a new or an old Invention?, S. Wein; Street Signals and Traffic Warnings in Connection with Fire Apparatus, L. S. Brach; Early Telephone Experiences on Railroads, C. S. Rhoads; Telegraphing by Eye Winks, F. A. Stumm; General Notes on Grounding, H. M. Wolf; The First Telegraph Line, J. C. Vail; Ohm's Law, J. L. Edwards.

One of the reasons why TELEGRAPH AND TELEPHONE AGE has become the successful magazine that it is, is because of the interest and co-operation it maintains with its subscribers. Any questions, whether technical or otherwise, are always cheerfully answered either in its columns or in letters.

If you are in doubt as to the advantages to be gained by a subscription, ask any subscriber what he thinks of TELEGRAPH AND TELEPHONE AGE. Once we gain a subscriber we rarely lose him. May we say the same of you?

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Efficiency Engineering in the Telegraph Service.

(Continued from page 443, October 1)

Efficiency in the management of an office is one of the best assets an individual can possess. Efficiency is what a merchant would term good will. In a business like the telegraph, which is rapidly expanding, into which new people are entering all of the time, efficiency becomes a matter of the utmost importance. Development in efficiency means everything to an individual. If the new comers are young men, they are usually of an observing turn of mind. They speedily note the manner in which the manager or chief operator transacts his business. If the affairs of the company are handled without confusion, the young men in the service will make the management a model to follow. We are all imitators. Someone has said that imitation is the sincerest flattery. Be this as it may, we naturally look for precedence to follow. What has been done before in the routine of business life is good enough for us today with the added refinements that develop from day to day to meet the changed conditions.

Back of all successful managements are the same fundamental principles. These underlying principles are absolutely necessary in the conduct of all trades. They simply differ in form. Successful management is the same whether it applies to a large industrial corporation or the management of a telegraph or telephone equipment. It is the know how that spells success. Every man has it in him to develop, broaden so to speak, to manage a department of the company which employs him. There is no task so trifling, no business so gigantic but that the simple principles of successful management can be understood by any man who makes the subject a study and is not afraid of hard work. Analyze the problems that confront you and plan a method of procedure that will bring satisfactory results.

A telegraph or telephone company is as carefully constructed as any building. It is divided into departments. All this is not the work of a day or of one man but of years of patient toil, study and hard work, backed by persistency to get the best business management. Conferences of managers bring about a uniformity of methods. Therefore, conferences are valuable for the reason that they convince those in charge of equipments in Chicago, San Francisco, New York, New Orleans or Cleveland that uniformity of methods is absolutely essential. The managers who work in harmony with one another produce teamwork that tells in the day's transactions.

The manager, the chief operator, the operator, the delivery clerk, the receiving clerk, the bookkeeper, the lineman, the wire chief and the messenger form a team not unlike that of baseball. If the messenger falls down, the service suffers. If the manager does not attend to his business, it receives a shock that is felt by the other eight players. If the chief operator does not attend to duty there is a fumbling that is noticeable. If the wire chief is not on deck the other players know it. If the receiving and delivery clerks hold the messages longer than they should the service feels the setback it receives.

When we deal with service the whole community is interested and everyone identified with a telegraph or telephone company has to be ever on the alert. If an official relaxes into indifference for a day or two it is noted all along the line, which means that everyone occupying subordinate positions to the man of indifference does not dare antagonize his superior official but he decides to drift with the tide. The wire industries are unlike almost every other business in that they have to be eternally supervised if good service is to be rendered. The question then resolves itself into how best and easiest an official can conduct the affairs of his office without friction and with the least wear and tear to himself. The solution is efficiency first, last and all the time. Study efficiency, which is another name for system. A locomotive would never pull a train over its division if one of its working parts was missing or impaired in any way. Liken this to a telegraph or telephone plant. Impress upon all employes the responsibility that rests upon them. The operating force is a machine. There must be no weak parts. When all the machinery of the wire plant is in good operation, it is simply then a case of watchfulness and lubrication to keep it in good working order.

(To be continued.)

Standard Telephone Construction Methods.

One of the most practical and helpful telephone books is Hall's Hand-Book of Telephone Construction Methods. It is non-technical in character and easily understood, and sets forth in the plainest language the best methods and most valuable experience in the telephone industry. It has 280 pages of specifications and 250 pages of illustrations, and is gotten up in a loose-leaf style of binding. Among the contents are specifications for exchange aerial construction; exchange underground construction; toll line construction; substation wiring; material specifications; material drawings, etc. The price of this book is $4.00 per copy, and orders may be sent to TELEGRAPH AND TELEPHONE AGE, John B. Taltavall, Publisher, 253 Broadway, New York.

Civil Service Examinations.

The United States Civil Service Commission will hold competitive examinations for senior railway signal engineer for the Interstate Commerce Commission and for a radio inspector, at salaries ranging from $1,800 to $2,700 and from $1,200 to $1,600 a year, respectively. Applicants for the signal engineer examination should apply before October 30 to the United States Civil Service Commission, Washington, D. C., or the secretaries of the United States Civil Service Boards at Boston, Philadelphia, Atlanta, Cincinnati, Chicago, St. Paul, Seattle, San Francisco, New York, New Orleans, Honolulu, St. Louis and Balboa Heights Canal Zone, and for radio inspector on November 7.

MR. JEFF W. HAYES' DEPARTMENT.

The Pleiades Club.

CHAPTER XXIII.

There was a secret meeting on the Planet Jupiter at which were present only those known to be American patriots. The object of this gathering was to confer with some of the prehistoric electricians and scientists with a view of obtaining some suggestion relative to the abatement of the submarine upon the Planet Earth. A number of these scientific men were alchemists and could convert a ten-pound stone into a five-pound chunk of gold, or an ounce of spring water into a three-carat diamond, and they proceeded to get their heads together to provide some means of abating the mischief performed by the submarines.

"You see, gentlemen," remarked Confucius, "we have minerals on the Planet Jupiter which do not exist on Mother Earth. For instance, we have the invisible paint, a coat of which put on a merchant ship would enable that vessel to pass through a fleet of submarines without being detected. I will give this idea and what I know about it myself to all alchemists on Jupiter, and perhaps they can suggest a formula which might be successfully manufactured on the earth, which, of course, would very easily solve the vexed problem. This formula can be wired to Mars, telepathically, and in the same way communicated to the earth, and, knowing the loyalty of the person handling the message, there would be no danger of its reaching enemies through an underground telegraph company, and their country would be busy trying to ascertain if there were no more ships to destroy.

"My country," continued Confucius, "has entered the war, and I feel at liberty in giving the world the benefit of my advice."

The gist of the conference was wired to the Planet Mars, where it was bulletined in the usual way, and later communicated to the earthly correspondent, who was cautioned to deliver the idea personally to the President. All of this goes to show some of the grand achievements the telegraph is working in bringing to an end this cruel war. There is nobody on either Mars or Jupiter who does not possess the idea of progressiveness, and each one is daily and hourly becoming more and more educated, and consequently more efficient.

"I was much pleased with the article in the issue of Telegraph and Telegraph Age of August 16 concerning efficiency," remarked Benjamin Franklin. "Of course I was not a telegraph operator and could not strike my colleague for the loan of a dollar until payday, but I know how embarrassing it was sometimes to have to refuse, and really how unnecessary it was for the borrower to effect such a negotiation. It often hampered the lender and was not doing a kind act for the borrower."

"Right you are!" chipped in the ever present Bogy. "Now, if they'd been like me that article would never have been written, for I never borrowed more than two bits at a time from anyone, and I never did believe in this high financiering. Why, I never would know what to do with a whole dollar if I had it all at one time," and Bogy sat down with a "7 x 9 smile" on his face.

At this moment Professor S. F. B. Morse approached the assemblage and announced that he had a telegram which he was about to send to Mars to be relayed to Mother Earth. "I will read you this message," said the professor, "and if anyone desires to amend it in any way he's at liberty to do so. 'It is my desire to impress upon the followers of the key that the present crisis should show each one's character. It is very necessary just now that all telegraph men should be imbued with patriotism, enthusiasm and loyalty. These three qualities are distinctively American, and each and every telegrapher should cease from entering into any combination which would portend evil to his employer. Anything of this nature, coming at the present time, would be unpatriotic and unwise in the highest sense of the expression. It is to be hoped that the American telegrapher will not do anything un-American while his country is in peril.' "

This message was transmitted to the Planet Mars, where it was transcribed on the beautiful sky of that planet, and immediately communicated to the terrestrial globe, with instructions to give Professor Morse's message the widest publicity possible.

Moses then entertained the company with a vivid word picture delineating the manner in which he and the Israelites passed through the Red Sea; Samson portrayed his battle with the Philistines, and Jonah told of his experience with the whale, all of which was listened to with the greatest attention.

Among the old military telegraphers present who saw service during the Civil War were: General Anson Stager, David Strouse, J. H. Bunnell, Milton F. Adams, G. W. Baxter, S. H. Beckwith, F. T. Bickfort, A. H. Bliss, W. J. Bodell, Captain Samuel Bruch and several others who were prominent in telegraph circles between the years 1860 and 1865

Putting One Over.

Bill Davison is a passenger conductor running out of Walla Walla, Wash., and he has served his company well for many years. Bill was a practical joker, and like all others of that bent of mind, does not like retaliation. The dispatchers on his road were the principal subjects of Davison's jokes, but there is always a day of reckoning, and Bill's arrived in time.

One day T. V. Mitchell, one of the dispatchers, told his colleagues of a plan he had thought out to get even with the practical joker.

"You see, boys," said Mitchell, "I have Bill Davison's signature, and I'm going to make good use of it."

Mitchell then proceeded to get a carbon sheet which he placed over an order for a set of books, and with the aid of a sharp stylus, very easily transferred Mitchell's signature to the blank order.

This order called for a set of books to cost $54.50. When the work was done the dispatchers complimented Mitchell on his artistic feat, and the order was immediately forwarded to the publishing house. Three weeks later an automobile halted in front of Davison's residence, the driver of which proceeded to unload a large package of books. When Mrs. Davison was apprised of the arrival of the books, she immediately told the agent that she did not believe that her husband had ordered them, but she was informed that they possessed his order for the same which they exhibited. Even this did not satisfy the lady, who, however, allowed the books to be placed in the parlor pending developments. When Bill Davison reached home and was acquainted with the matter, he grew very indignant, and called up the publishing house by telephone.

"Come up," he said, "and show me my signature wherein I ordered these books. If you can show it to me, I will take the books, but if you cannot, I will kick you into the next county."

A half an hour later a mild-mannered man rang the door-bell of Bill Davison's house, and that worthy appeared. The man showed Davison a piece of paper which was scrutinized very closely.

"Yes, that's my signature, all right," said Davison, "but for the life of me, I cannot remember signing the same. I cannot go back on my own signature, so will make you out a check for the amount."

This was done, and a comparison of the signature on the check with that of the book order showed them to be identical. This occurrence took place some years ago, and when Bill Davison reads this story he will understand for the first time how the boys in the dispatcher's office put one over on him.

An Active Old-Timer.

A wonderful old gentleman is Sydney A. Josselyn, who was born in Highgate, Vt., December 25, 1830, and raised in Buffalo, N. Y. He migrated to Heyworth, McLain County, Ill., in 1856, and became agent for the Illinois Central Railroad, with which he remained for over twenty years as agent and telegraph operator.

Mr. Josselyn is the father of Benage S. Josselyn, formerly president of the Portland Railway, Light & Power Company, at Portland, Ore.

Mr. S. A. Josselyn is still at work as an accountant in the auditor's office of the Portland Railway, Light & Power Company at Portland and expects to round out at least one hundred years and keep at work all the time.

LETTERS FROM OUR AGENTS.

New York Postal.

A new office will be opened about October 20 at 262 Thirty-ninth Street, Brooklyn, to take care of the growing business in the Bush Terminal section. Up-to-date telegraph and telephone facilities will be installed and Manager F. G. Payne of Brooklyn is looking forward to big returns. The office will be under the direct supervision of J. Finnegan, now in charge of the 453 Fifth Avenue office.

Jos. J. McCauley, formerly connected with the office of the city manager, and now a first lieutenant in the United States Signal Reserve Corps, has been assigned to duty at Fort Dodge, Des Moines, Iowa.

New York Western Union.

Geo. C. Gute is substituting for G. E. Palmer, chief operator, who is absent on his vacation and who will not return to his office until the end of October. Mr. Palmer will spend his holiday with his father, who lives on a farm at Belchertown, Mass.

Miss C. G. Ekstrand has been transferred from the position of assistant chief operator in charge of the telephone bureau to that of force chief of the automatic department. Miss F. E. Keegan succeeds Miss Ekstrand as assistant chief operator in charge of the telephone bureau.

L. Smearer, formerly in charge of the automatic department, has been transferred to the Central Cable Office, 16 Broad Street, as assistant chief operator, succeeding F. C. Bachop, promoted to senior supervisor of the trunk division on the early night force in the main office.

E. G. Rixon, of the automatic department, has also been transferred to the Central Cable Office as multiplex attendant.

J. A. Berry, cashier, has moved his department from the eleventh to the eighteenth floor, where he has larger quarters. The space is occupied by the cashiers, collection and credit departments, and the money transfer agents. The New York Telegraphers' Aid Society, the Telegraph and Telephone Life Insurance Association and the Serial Building Loan and Savings Institution are also located on this floor.

S. B. Haig, division traffic superintendent, will occupy the space vacated by Mr. Berry on the eleventh floor, and the space vacated by Mr. Haig's department will be taken up by the automatic school and employment bureau. The room vacated by the money transfer will be absorbed by the telephone school.

D. A. Summers, wire chief in the plant department, who recently came to this office from El Paso, Tex., died September 27.

At the theatre party given by the Western Union Educational Society at the Orpheum Theatre, Brooklyn, October 4, the trophy recently won by the Service Department Baseball Club was on exhibition in the lobby of the theatre. The trophy consists of an ebony mounted base on a silver sub-base. On top of the ebony base is a silver plate with three miniature baseball bats crossed. In the opening formed by the crossed bats is a full size silver baseball, and the trophy is engraved "Western Union Educational Society Baseball Championship, 1917, Won by Service Department." On a shield mounted on the ebony base around the silver sub-base are engraved the names of the players making up the Service Department team. The trophy will be on permanent exhibition in the Service Department of this office.

Boston Western Union.

On September 2 the Western Union opened its office at Camp Devens, Ayer, Mass., in readiness for the first contingent of drafted men, which arrived a few days later. The problems of traffic organization in a new city of 50,000 people, with no city directory, and where no one seems to know anyone else, were given to District Cable Manager Lister, of Boston, for solution. Mr. Dana H. Russell, recently returned to the Western Union service after a three-year stay in Brazil, acted as his chief assistant, and has recently been appointed manager of the office.

Chicago Western Union.

Geo. E. Delaronde, an old employe of this office for many years in the Indiana division, died September 27.

Ownership Statement.

Statement of the ownership, management, circulation, etc., required by the Act of Congress, of August 24, 1912, of TELEGRAPH AND TELEPHONE AGE, published 1st and 16th days of each month at New York, N. Y., for October 1, 1917.

State of New York, } ss.
County of New York, }

Before me, a notary public in and for the State and county aforesaid, personally appeared Thomas R. Taltavall, who, having been duly sworn according to law, deposes and says that he is editor of TELEGRAPH AND TELEPHONE AGE and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are

Publisher, John B. Taltavall, 253 Broadway, New York.
Editor, Thomas R. Taltavall, 253 Broadway, New York.
Managing Editor, none.
Business Managers, none.

2. That the owners are:

John B. Taltavall, 253 Broadway, New York.
Thomas R. Taltavall, 253 Broadway, New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are:

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

THOMAS R. TALTAVALL, Editor.

Sworn to and subscribed before me this 20th day ot September, 1917.

[SEAL] JOSEPH R. FRITH,
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Kings County Register's No. 8047.
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Saturdays 1 p. m.

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NEW YORK, NOVEMBER 1, 1917.

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Recommending Self for Advancement.

A novel experiment is being tried on the Erie Railroad with a view to securing candidates for advancement to higher positions in its service. Employes are asked to write to their superintendents stating their desires as regards positions they would like to fill, giving their past records. Telegraph operators and others connected with the telegraph service come within the scope of the invitation, and no doubt there will be some generous letter-writing, for we cannot imagine that any man in the service, in any capacity, is content to stay where he is.

It is natural for a man to believe that he has the qualifications necessary to fill higher positions than the one he now occupies, but whether he has, or not, will have to be proved before he can hope to realize his ambitions.

This invitation to employes is based on a sound principle. No man will apply for a better position unless he feels certain that he can fill it, and he will think well before he recommends himself for advancement. It will encourage men to study and fit themselves for greater responsibilities.

Take Time for Self-Improvement.

Someone has said that youth is the best time for improvement, but it is a regrettable fact that all youths do not appreciate this important reality. The telegraph service has within its fold youths of both sexes and if they but knew it the present offers the greatest opportunities of their lives to build up a future name for themselves. Study is the secret—not necessarily all study, but some study. Constant study is not advocated, but some study ought to be made a part of the daily life of a young man just as much as eating, sleeping and enjoyment.

A portion of each day should be devoted to earnest study, and while one is thus improving his opportunities he is at the same time making life, on the whole, more enjoyable. There is nothing more promotive of confidence in self, and in the enjoyment of life, that the knowledge that one is improving his mind as well as enjoying the passing pleasures.

Second Liberty Loan.

The second Liberty Loan is now offered for public subscription. The amount of this loan is a minimum of $3,000,000,000 in government bonds of $50 and multiples thereof. In case the loan is over-subscribed the Secretary of the Treasury reserves the right to issue bonds up to one-half of such over-subscription.

They are government bonds in the form of engraved certificates bearing the promise of the government and people of the United States to pay in full, with interest at maturity.

Liberty bonds are as safe as the United States.

Interest: 4 per cent, payable semi-annually May 15 and November 15.

Denomination: $50 and multiples thereof.

Conversion: If during the war the government shall issue another series of bonds at a higher rate of interest the holders of this issue may exchange them for bonds of the same maturity as this issue but bearing the higher rate. (Failure to take advantage of this privilege, should it arise within the time set for exchange, will result in the termination of this privilege, though again thereafter bonds bearing interest at a higher rate than 4 per cent be issued.)

Maturity: The bonds will be paid off on November 15, 1942; but the government has the privilege of paying off the issue, in whole or in part, at par and accrued interest, on and after November 15, 1927.

Exemption: Exempt both as to principal and interest from all national, state and local taxation, except, (a) estate or inheritance taxes, and (b) graduated additional income taxes, commonly known as sur-taxes, and excess profits and war profit taxes imposed by the United States. Interest on an amount of bonds the principal of which does not exceed $5,000 owned by any individual, partnership or corporation is exempt from the taxes provided for in clause (b).

Delivery: About October 10, 1917, a supply of these new bonds will be ready for immediate delivery to subscribers, in amounts not in excess of $1,000 to any one subscriber, provided payment therefor is made in full. All bonds will be ready for delivery on or before January 15, 1918.

Apply to any bank, trust company, department store or bond house. Application blanks may be had at these places, of any Liberty Loan Committee, and through many other agencies.

No commission or fee of any kind, is charged by any agency.

Partial payments are required as follows:

2% with application
18% November 15, 1917
40% December 15, 1917
40% January 15, 1918

You may buy any amount up to $1,000 and make full payment at once, receiving your bond immediately, or full payment may be completed on November 15 or December 15.

A partial payment plan has been adopted by many banks. You may buy a $50.00 Liberty Bond at $1.00 down and $1.00 a week. Details may be had of your bank, employer or any Liberty Loan Committee.

Telegraph and Telephone Patents.

ISSUED SEPTEMBER 18.

1,240,257. Telephone System. To F. N. Reeves and A. E. Lundell, New York.

1,240,306. Telegraphy. To W. M. Bruce, Springfield, Ohio.

1,240,418. Telephone System. To L. C. Bygrave, London, England.

1,240,659. Telephone Mouthpiece. To W. Booth, East Liverpool, Ohio.

ISSUED SEPTEMBER 25

1,240,974. Telephone Wall Set. To. W. W. Henry, Atlantic, Mass.

ISSUED OCTOBER 2.

1,241,565. Method of and Apparatus for Radiosignaling. To H. Shoemaker, New York.

1,241,925. Telephone Exchange System. To H. P. Clausen, New York.

1,241,731. Telephone Mouthpiece. To. J. F. Havlena, Detroit, Mich.

1,241,926. Insulation of Condensers for Telephone Circuits. To C. Cordes, Magdeburg, Germany.

1,242,008 and 1,242,010. Telephone Exchange System. To A. E. Lundell, New York.

1,242,051. Combined Telegraph Key and Spring Jack Switch. To C. B. Scollard, Seattle, Wash.

ISSUED OCTOBER 9.

1,242,164. Semi-Automatic Telephone System. To E. D. Fales, Chicago, Ill.

1,242,338. Telephone System. To H. M. Faris, Chicago, Ill.

1,242,374. Automatic Trunking System. To E. A. Reinke, Rochester, N. Y.

1,242,384. Automatic Telephone System. To A. B. Sperry, New York.

1,242,458. Automatic Party Line Telephone System. To F. Lubberger, Chicago, Ill.

1,242,470. Telegraph Key. To J. G. Peterson and O. H. Huebel, Jersey City, N. J.

1,242,655. Telephone Exchange System. To H. P. Clausen, New York.

1,242,672. Telephone Equipment. To C. A. Finley, New York.

Stock Quotations

Following are the New York closing quotations of telegraph and telephone stocks on October 29:

American Tel. and Tel. Co.	114
Mackay Companies	75-77
Mackay Companies, pfd.	59-62
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2⅞
Western Union	89

PERSONAL.

MR. STEPHEN BERRY, publisher of the *Masonic Token*, at Portland Me., is a forty-niner of the telegraph, having entered the service in 1846. His paper is full of interesting matter to the Masonic fraternity.

MR. C. W. GULICK, an old-time and military telegrapher, living in retirement at White River Junction, Vt., after a visit of several months spent in Minnesota and Missouri, has returned to his Vermont home for the winter.

MR. JEFF W. HAYES, who had recently undergone an operation in the hospital in Portland, Ore., has been sufficiently restored to health as to enable him to return to his home in Chicago. He has again resumed business activity with his old-time vigor.

MR. FRANK A. MUNSEY, an old-time telegrapher, proprietor of the New York *Sun* and various well known magazines, has purchased the old Stewart Building at Broadway, Reade and Chambers Streets, New York, which he will use as the home of his publications.

PROFESSOR W. S. FRANKLIN, for many years professor of physics and electrical engineering at Lehigh University, Bethlehem, Pa., and author of many textbooks on electrical engineering, has accepted a position as special teacher and lecturer at the Massachusetts Institute of Technology, Boston.

MR. SAMUEL REESE, of Cleveland, Tenn., a veteran of the United States Military Telegraph Corps, met with a serious accident recently when an automobile in which he was riding had a collision, throwing Mr. Reese out and breaking his left leg. He is now in a sanitarium in Tennessee recovering, but is not yet out of danger.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Major C. P. Bruch, vice-president of this company, New York, left for Pittsburgh on October 29 on company business. He will stop at Washington on his return, in the interests of the government, and expects to be absent from his office about a week.

Mr. G. W. Ribble, general superintendent, Atlanta, Ga., has returned to his office after an inspection trip through the first district.

General Superintendent A. B. Richards, San Francisco, Cal., has completed an inspection trip through the third district, accompanied by Superintendent V. V. Stevenson.

Mr. H. C. Shaw, division electrical engineer of the Pacific Division, San Francisco, Cal., made an inspection trip through his division recently. Extensive improvements are being made to handle the increasing business.

Mr. John Nering, manager at Chicago, has returned from a vacation spent at French Lick, Ind.

Mr. G. M. Foote, manager of the Washington, D. C., office, was a recent New York visitor.

Mr. J. H. Gingrich, chief operator of the Harrisburg, Pa., office for many years past, has resigned to devote his entire time to the presidency of The Modern Textile Company, manufacturers of underwear for women and children, which he organized and developed. Mr. Gingrich, who is an old Postal employe, has the well wishes of all who have the pleasure of his acquaintance.

Mr. W. H. Reese has been promoted to the position of chief clerk to Superintendent S. H. Mudge, at Kansas City, Mo.

No Magnetic Club Dinner.—The usual fall dinner of the Magnetic Club will not take place this year, on account of the disturbed conditions due to the war.

Managers Appointed.—T. P. Adams at Millen, Ga.; Gerald Chapman, Monroe, Mich.; E. M. Andrews, Clinton, Ill.; James Smith, Grand Island, Neb.; Frank G. LeDuke, Kingman, Ariz.; F. W. McKechnie, Eugene, Ore.; T. A. Rose, Chico, Cal.; J. E. Fogarty, Poughkeepsie, N. Y.; J. S. Parker, Salisbury, Md.; Louis Miles, Newton, Iowa; E. H. Keyser, Baton Rouge, La.; W. E. Crozier, Pine Bluff, Ark.

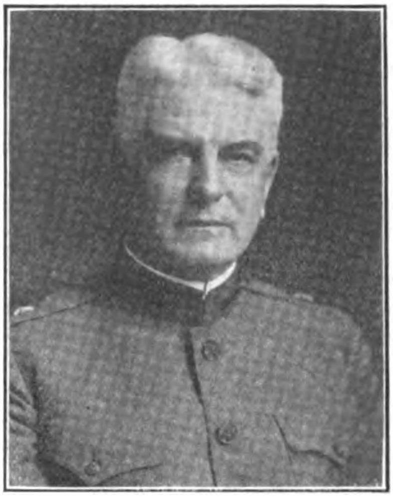
Liberty Loan Booths for the sale of second Liberty Loan bonds have been placed in the lobbies of the main offices of the Postal Telegraph-Cable Company and the Western Union Telegraph Company in New York.

The Railroad Problem.

Mr. William W. Cook, general counsel of The Mackay Companies, New York, has issued a 36-page pamphlet entitled: "A Proposed Solution of the Railroad Problem." Mr. Cook has for ten years advocated government control of railroads without government ownership, but with government financing. "The same fundamental idea," he says, "has now been adopted as a war measure in Great Britain and Canada, and soon will be in the United States."

After discussing the subject at length he concludes with the statement that he believes his plan would accomplish all of the advantages and avoid all of the disadvantages of government ownership.

Major Chas. P. Bruch of the Signal Corps Reserve, U. S. Army, vice-president of the Postal Telegraph-Cable Company, New York, and a member of the sub-committee on telegraphs and telephones of the Council of National Defense, is one of the most progressive and best known men in the telegraph service, and his extensive knowledge in telegraph affairs is helping the Government very effectively. Major Bruch is also president of the Ohio Society of New York.



Heavy Tax on Telegrams and on Telephone Conversations.

The war income tax bill which takes effect November 1 places a tax of five cents upon each telegraph, telephone or radio, dispatch, message or conversation, which originates within the United States, and for the transmission of which a charge of fifteen cents or more is imposed. The tax is to be paid by the person, corporation, partnership or association paying for the services or facilities rendered.

This is the highest tax ever imposed on telegrams and telephone conversations in this country. A telegram costing twenty cents will hereafter cost the sender twenty-five cents, and a message costing $1.00 at the regular rate will be $1.05. The low priced business will therefore cost more proportionately. The same, of course, applies to telephone conversations.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

Messrs. Newcomb Carlton, president; Lewis McKisick, assistant to the president; J. C. Willever, vice-president in charge of commercial, and W. N. Fashbaugh, vice-president in charge of traffic, are absent on a business trip to the principal Pacific Coast points. Mr. W. C. Merly accompanies the party as secretary.

Mr. G. W. E. Atkins, vice-president, has returned from his annual holiday, which he passed in touring the nearby states by automobile.

Mr. R. P. Cowardin, formerly and for many years identified with the service at Denver, Col., but for the past two years wire chief at Richmond, Va., has been appointed division wire chief for the Mountain Division with headquarters at Denver.

Mr. Louis Caspar, traffic supervisor attached to the office of Vice-President Fashbaugh, New York, has returned to his desk after a trip of several months extending to the Pacific Coast.

Mr. Porter E. Ramsey was recently appointed district plant superintendent of the fifth and sixth districts of the Southern Division. He is a native of Tennessee and has been in the Western Union service since 1900.

Mr. V. F. Hogg, manager of the La Junta, Col., office, has been appointed manager of the Albuquerque, N. M., office, relieving Mr. L. L. Leech.

Mr. E. D. Slingerland, formerly in the employ of this company in Pacific Coast cities, but for the previous four years in the service of the government in the Philippine Islands, during the past two years of which time he acted as postoffice inspector in a district comprising several provinces, recently returned to the United States, and is now wire chief of the Ashland, Ore., office of this company.

Mr. W. B. Crane, of the Louisville, Ky., office, has been appointed district commercial manager, with headquarters at Nashville, Tenn.

Messrs. W. L. Jacoby, president, and R. C. Baker, general superintendent, Controlled Companies of American District Telegraph Company, New York, are on an inspection trip to the Pacific Coast.

Another Special Payment.—This company will make another special payment to its employes on or about January 1, 1918.

Plant Department Changes.—The second district of the plant department of the Southern Division, which comprises the states of Georgia, Florida and Alabama, has been abolished, and consolidated with the division plant superintendent's office at Atlanta, Ga.

The Earnings Report for nine months ended September 30, 1916 and 1917 (month of September, 1917, estimated) is as follows:

	1917	1916
Total Revenues	$57,320,203	$45,789,770
Maintenance Repairs, and Reserved for Depreciation	$ 7,487,037	$ 6,194,417
*Other Operating Expenses, including Rent of Leased Lines and Taxes	38,233,855	29,186,663
Total Expenses	$45,720,892	$35,381,080
Balance	$11,599,311	$10,408,690
Deduct Interest on Bonded Debt	998,887	998,887
Net Income	$10,600,424	$ 9,409,803

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*Includes proportion of special payments to employes for 1917.

Postal Telegraph-Cable Company of Texas.

Mr. Fred W. Werth, treasurer of the Postal Telegraph-Cable Company of Texas, Dallas, Tex., has resigned to enter the navy at San Francisco as yeoman. Mr. Werth is twenty-five years of age. He entered the employ of this company as check boy in 1907, advanced to clerkship in the auditor's office in 1910, and was elected secretary and treasurer in 1915. During his employment in the auditor's office he studied law and was admitted to the Texas bar in 1914. The many friends of Mr. Werth are sincere in their wishes that he may go far in his new line and return without a scratch.

Mr. R. K. Smith has been appointed treasurer of the company, vice Mr. Werth. Mr. Smith entered the service of the company in December, 1913, as operator at Fort Smith, Ark., advanced to the managership of that office in March, 1914, and was transferred to Alexandria, La., in December, 1915. Mr. Smith's record as manager at Alexandria, La., and some special relief duties given him to perform, brought him into the limelight, with these results.

THE CABLE.

Legal Time has been restored in Russia and Portugal.

Cable Restored.—The Menado cable has been restored, thus reëstablishing communication with the provinces of Menado and Ternate, Dutch East Indies.

Mr. D. A. McLaine, superintendent of the Bay Roberts, N. F., cable station of the Western Union Telegraph Company, has retired from active service on a pension. He has been identified with this company since 1881.

Mr. W. T. Jones, acting superintendent, who was previously the assistant at Bay Roberts, succeeds Mr. McLaine as superintendent.

Mr. J. C. Bailey, formerly supervisor at the Bay Roberts station, succeeds Mr. Jones as assistant superintendent.

CANADIAN NOTES.

GREAT NORTH WESTERN.

Mr. A. E. Holmes has been appointed chief operator of the Great North Western Telegraph Company at Winnipeg, Man., to succeed A. D. Campbell, deceased.

CANADIAN PACIFIC.

Mr. J. McMillan, manager Canadian Pacific Railway Company's Telegraph, Montreal, has returned from a rest at St. Andrews, N. B., and Lake Edward, Que., and is now on an inspection trip to the Pacific Coast.

Mr. W. J. Camp, assistant manager, has returned to duty from Sharbot Lake, where he enjoyed a well earned rest.

Mr. W. M. Thompson, superintendent of traffic, Eastern Lines, is at present acting superintendent, Atlantic Division, during the absence on sick leave of A. C. Fraser.

Superintendent W. D. Neil, Montreal, has returned from his holiday, during which J. Mitchell, inspector, was acting superintendent.

Mr. A. McKenzie, who has been telegraph agent for this company at Guelph, Ont., for the past twenty-five years, has resigned on account of ill health, being succeeded by Mr. J. T. Troyer, of Toronto. Mr. Troyer for some time past has been press operator for the company in the Toronto *News* office.

THE TELEPHONE.

Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company, made an address before the Eastern States Agricultural Exposition Association at a recent meeting in Springfield, Mass. He is vice-president of the association.

Mr. C. G. Du Bois, comptroller of the American Telephone and Telegraph Company, New York, has been granted a leave of absence for six months to give his attention to the work of the Red Cross at national headquarters in Washington, D. C., as comptroller of that organization.

George V. Leverett, aged seventy-three years, former general counsel of the American Telephone and Telegraph Company, died in Boston, October 19. Mr. Theo. N. Vail, president, and other officials of the company attended the funeral, which took place October 22.

Mr. E. B. Field, president of the Mountain States Telephone and Telegraph Company, Denver, Col., was married on September 25 to Miss Anna J. Henry. Miss Henry had been associated with Mr. Field in the telephone business since 1883. Following the ceremony, Mr. and Mrs. Fields made a six weeks' visit to Chicago, Boston, New York and Atlantic City.

Loan Subscription.—The American Telephone and Telegraph Company and its associated companies have subscribed for $5,000,000 worth of the second Liberty Loan bonds in behalf of themselves and their employes.

Memorial to Dr. Alexander Graham Bell.

The memorial erected in honor of Dr. Alexander Graham Bell, and his invention of the telephone in Brantford, Ont., in 1874, was unveiled in that city October 24, in the presence of the Governor-General of Canada, the Duke of Devonshire, and other distinguished persons. Doctor Bell was present and took part in the ceremonies. Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company, had been invited, but sent his regrets at not being able to be present. Bell telephone interests were represented by other gentlemen, however.

The memorial cost over $25,000, while the total outlay for the grounds and Bell homestead, dedicated as the Alexander Graham Bell Gardens, represent a cost of $65,000.

Colonel J. J. Carty.

J. J. Carty, chief engineer of the American Telephone and Telegraph Company, and lately appointed senior major of the Signal Reserve Corps, has been appointed by President Wilson a colonel in the Signal Corps in the regular army of the United States, to rank as such from August 15.

Bell Telephone System Report.

The earnings report of the Bell Telephone System in the United States for eight months ending August 31, compared with the same period last year, shows total operating revenues for this year, $194,337,712, as against $171,608,490 last year; total operating expenses, $133,520,263 and $113,568,419; net operating revenues, $60,817,449 and $58,040,071; surplus earnings, $11,433,608 and $14,445,051.

Earnings Report.

The earnings report of the American Telephone and Telegraph Company for nine months ending September 30, shows:

	1916	1917
Total earnings	$37,674,526.24	$42,338,883.28
Expenses	4,180,119.62	5,462,772.12
Net earnings	$33,494,406.62	$36,876,111.16
Deduct interest	4,771,846.90	7,993,363.10
Balance	$28,722,559.72	$28,882,748.06
Dividends paid	23,241,252.16	23,769,253.98
Balance	$5,481,307.56	$5,113,494.08

American Telephone Line at the Front.

The first American long-distance telephone line in France has been completed by the Army Signal Corps of Engineers. It connects General Pershing's headquarters with the farthest billets and camps, and branches radiate to other villages. It is entirely independent of all the existing lines.

United States Independent Telephone Association.

It is proposed to postpone the date of the annual convention of the United States Independent Telephone Association from December 11, 12, 13 and 14 until some time next June. There is considerable opposition to the postponement on the part of the men engaged in the independent service.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. George S. De Sousa, traffic manager, San Francisco, visited Seattle, Wash., and Portland, Ore., recently, being absent from his office one week.

Mr. E. B. Pillsbury, general superintendent, spent his vacation across the water—in Brooklyn.

Mr. L. C. Everett, assistant engineer, used up his vacation fishing and clamming on Cape Cod.

Miss Katherine Hoffman, secretary to the comptroller, has resigned after five years' service, and is succeeded by Mr. Walter W. Baldwin.

Mr. G. W. Hayes succeeds Mr. Lee Lemon as purchasing agent, Mr. Lemon having been assigned to other duties.

Mrs. Harold J. Kennedy, of the dictation department, was presented with a handsome dinner set of ninety pieces by her office associates on the occasion of her marriage.

Misses Kennelly and Wishart have returned from their vacations.

Liberty Bond Memorial for Lost Operator.

A Liberty Bond memorial to Herbert F. Watson, the radio operator who was lost on the United States transport "Antilles," has been planned at the Farm and Trades School on Thompson's Island, in Boston Harbor, from which Watson was graduated. The pupils of the school will contribute toward a bond.

OBITUARY.

Death of Robert G. Callum.

Robert G. Callum, aged sixty-three years, manager of the Mutual District Messenger Company at Washington, D. C., and one of the best known telegraph officials in the capital, died from the effects of an operation, October 22. Mr. Callum, who was a native of Danville, Va., was identified with the Western Union Telegraph Company for over forty-five years, beginning as a messenger in his native town. He soon became an expert telegrapher, removing to Washington in 1881, where he had since resided. He was the inventor of the burglar alarm clock used by the Mutual District Messenger Company, and which protects the United States Treasury. He is survived by two brothers and one son, the latter Preston D. Callum, assistant manager of the Baltimore office of the Western Union Telegraph Company until about two months ago, when he joined the officers' training camp at Fort Myers, Va. The pallbearers were H. F. Taff, C. C. Mothershead, G. Simpson, Chas. King, E. J. Fuller and D. F. Brown.

C. E. WAGNER, aged sixty-seven years, a member of the telegraph bureau of the New York City Police Department, died in Brooklyn, October 22.

JOSEPH T. COOK, aged forty-seven, for many years in charge of the telegraph department of Post & Flagg, stock brokers, New York, died at the Polyclinic Hospital, October 5.

MELVIN E. BRADBURY, aged twenty-one years, a former telegrapher of Boston, was a victim of the sinking of the United States transport "Antilles." He served in a regiment on the Mexican border and was transferred to the hospital service in France. He was on his way home when he was lost.

EBEN E. EASTMAN, aged sixty-seven years, night chief operator at Portland, Me., at the time of his retirement several years ago, died in South Portland, Me., October 14. He had been in the Western Union service forty-seven years, and went to Portland in 1881. Mr. Eastman owned a fruit grove on the Isle of Pines in the West Indies.

JOHN L. FULLER, aged seventy years, manager of the North American Telegraph Company at Duluth, Minn., died in that city September 23. He opened the Duluth office in 1887 and continued as manager to the time of his death. He was well known throughout northern Minnesota and Wisconsin, both as a pioneer and through his business associations.

T. R. MCNELL, aged ninety-four years, proprietor of the well known Smith & McNell restaurant in New York, died at his home in New York City, October 12. Smith & McNell's was one of the most famous and popular hotels and eating places in the country and was liberally patronized by telegraphers . Mr. McNell was a well known figure to the patrons of the restaurant. He moved about the place with the waiters removing soiled dishes and slicking up the tables. It is stated that he kept no running accounts, but paid cash for everything on delivery. Owing to Mr. McNell's advanced age he passed the business into other hands, but the new proprietors could not make a success of it and it was closed two or three years ago. Mr. McNell was reputed to have accumulated a large fortune. He was born in Belfast, Ireland, and had a striking figure. He was tall and slender and straight as an arrow, and had a kindly face and was known to thousands of members of the telegraph profession.

NOT RESPONSIBLE.—According to a recent ruling by Justice Ross in Syracuse, N. Y., a telegraph company cannot be held responsible for loss of money paid out on a money transfer order obtained by fraud.

NATIONAL ELECTRICAL CODE.—At the meeting of the electrical committee of the National Electric Fire Protection Association in New York, October 23 and 24, the committee on grounding made a supplementary report, which was adopted after several changes were made. Chairman F. E. Cabot, who has presided for about twenty-five years, announced his resignation. No successor has been named yet.

Thirty-fifth Anniversary of Electric Light in New York.

The thirty-fifth anniversary of the introduction of the incandescent lamp in New York was commemorated October 18 by the dedication of a bronze tablet which is to be placed on the site of the original Edison generating station at 257 Pearl Street, New York. The exercises were held in connection with the annual electrical exposition at the Grand Central Palace.

The Pearl Street station began operation on September 4, 1882, according to plans conceived and executed by Mr. Thomas A. Edison. The tablet is erected by the American Scenic and Historic Preservation Society and the New York Edison Company.

DELAY IN DELIVERY OF MESSAGE.—The third district court in Salt Lake City, Utah, recently dismissed a suit for $5,000 against one of the telegraph companies for alleged delay in the delivery of a message.

Mr. J. P. Edwards, division traffic superintendent, Chicago, Ill., in renewing his subscription for another year writes: "I am sure that many friends are glad to congratulate you on the thirty-fifth anniversary of your continued publication of TELEGRAPH AND TELEPHONE AGE. Count me among those who hope to extend solicitations on the seventieth anniversary."

Comets.

BY JOSEPH HURLEY.

[In our issue for September 1 appeared an article by Thomas Boyle, under the title, "The Life of Joseph E. Hurley, Telegrapher, Humorist and Gentleman Hobo," which has aroused much interest and revived many reminiscences of that erratic and versatile genius. Hurley had a brilliant mind and had such a command of English that it was natural for him to contribute to this paper his observations and opinions of things and events. In his time he was easily the foremost writer of telegraphic literature which he made radiant with native humor.

Many requests have been made to reproduce for the benefit of the present generation some of Mr. Hurley's stories. The one on "Comets," which was written for TELEGRAPH AGE and printed in its issue of April 1, 1894, is a good example of Mr. Hurley's literary style. It is intensely interesting and we are glad of the opportunity to reprint it for the benefit of the present-day readers.]

In a Western telegraph office where I played a short engagement of one consecutive month, the chief operator was very popular. His assistant was not so well liked. A reformed drinking man himself, he was very severe on others who were less fortunate. Whenever he saw some poor fellow struggling against his failing and trying to skip his periodicals, he would pat him on the back encouragingly and say, "You'll break out soon, now," "You are past due," etc.

One morning word came that this prophet was sick abed and would not be down that day. The message was sent from a branch office three miles from his residence. About noon he stumbled into the operating room with cigar ashes on his hat, no necktie or vest, and hardly anything else on but a jag. He moved around the room quietly trying to borrow five dollars and got a dime. Only half of the switch plugs had numbered tags on them; the other half the assistant kept in his head, consequently business was temporarily suspended while he was mixing up the switch for the chief. The latter requested him several times to go home and take a balance on himself, at last carrying out the suggestion by walking down the elevator with him. Next day, when he felt better, this entry was discovered in the log book: "Very busy; assistant chief drunk today," which led to the following conversation:

A. C. O.—"What does this mean?"

C. O.—"What it says. Ain't it so?"

A. C. O.—"Yes; but it is not necessary to publish it."

C. O.—"If it is so it must stand."

Thereafter the relations between the two men became very much strained. If the chief was at the switch and the other man came there the former would turn aside and begin monkeying with the galvanometer, and if vice versa the assistant would think of some stuff about wires and rush off and pretend to book it. The operators could see them playing horse and were amused. I knew the assistant contemplated something very, very funny, because I caught him on two occasions laughing while chasing bugs off a quad. When his nerve had returned he put down this entry: "Very dull; chief has been sober today," and another colloquy was overheard:

C. O.—"What's this about?"

A. C. O.—"You. Ain't it so?"

C. O.—"Yes, but I am sober every day."

A. C. O.—"If it is so it must stand. See!"

Not long afterwards both entries mysteriously disappeared and the entente was resumed, but the prophet became less patronizing and often remarked sadly that there was nothing sure but death and taxation.

There is an operator floating around this country whom I believe to be the original Arizona Kicker. I never knew his right name. He had so many aliases that when we met I simply said, inquiringly, "How are you, Mr. ——"; he did the rest.

In Portland, Oregon, he alleged to me that he just arrived from Chihuahua, Mexico, and he would throw this long name into his conversation every few minutes, snapping out the Chee-waw-waw at you as if challenging a dispute of the pronunciation. I suppose if some poor tenderfoot had called it Chy-hewa-hewa, what it looks like, this terrier would have torn him to pieces. I took the matter coolly and spoke to him entirely in Spanish, only to discover that his knowledge of that language was limited to the pronunciation of San Jose, San Juan, San Joaquin, Calientes, Saltillo and a few other towns, and the words aguardiente y tabaco (brandy and tobacco). I keep on tap some choice questions in Spanish to test the genuineness of operators claiming to have traveled in the republic to the south of us. I picked them up in Mexico, Missouri.

The Kicker was low and heavy set, with stubby beard, which he said was often easier to raise than the price of a shave. His hair was prematurely gray, caused, he alleged, from sitting in cold churches. Void of all ambition, he was as careless a specimen as I have ever met in any profession. He ate meals as so much fuel, and only wore clothes, or "togs," because he would have been arrested if naked.

Shoes he called "skates," and a hat was a "lid." I once canvassed him to join the T. M. B. A., so he would not be buried by general subscription after he fell through a trestle. He replied that there need be no expense planting him; he would be satisfied if someone sharpened his feet and drove him down in the ground anywhere.

Another time I overheard a lady operator, sitting next to him, trying to engage him in conversation. Among other things she asked him if he would not like to have large, round, hazel eyes. He remarked, with some irritation, that he could see well enough out of the eyes he had. There was no romance about the man; an eye was an eye and a tooth was a tooth.

In Omaha I found him in a strange dilemma. The superintendent who had black-listed him had died before restoring him to good standing, so he was obliged to go hobnobbing around with spiritualistic mediums trying to get the ear of that official in the other world; in the meantime he was selling clothes wringers to enable him to exist in this.

"Why did you leave your last position?" I asked him one winter's night in Chicago, as he was panhandling me for a "piece of silver," while the snow was sifting up his pant legs. I only asked the question to see if he had altered his style of lying. He used to be a very clumsy liar, but has improved somewhat. The nearest he came to working in Chicago that time was looking into the operating room. He told me he saw axes hanging around on the walls which he believed were to be used in cutting down the force in the fall. He also informed me that the drinking water was kept in an old whiskey barrel in order to "wean" off the topers who could not afford to take the Keely cure.

Now, as other strangers have been misled by these things, I will explain. The axes are simply for an emergency in case of fire. I know it is the custom in that city to let men go unceremoniously and mark them "dropped" on the records, but it is purely a local term and does not mean that violence has been used. As to that barrel in the old office: it did look odd, but was only a coincidence. I do not believe it was either intended as a reflection or for any curative qualities. I have known the Western Union a long time and have never detected any tendency on their part to go into the "weaning" business.

I told this walking delegate that he would be out of work less if he was not a pessimist. He got wild and showed fight; said he thought I meant "one of them fellows who didn't strike, but were not Brotherhood men."

Arizona could name more towns where he could not work than where there was any possible prospect for him. In fact, he was like playing a game of chess and had only a few more moves left before being checkmated. He claimed he was kept out of the Western Union in New York on account of his "religion," whatever that might be. I don't think he could get much on it in a theological pawnshop—'twould be like a "Hielandman pledging his breeks."

Losing sight of him for over a year, I was commencing to think that his feet had been sharpened, when, chancing to arrive in Detroit last month on my annual tour, I saw him at the depot, looking dejected.

"Hello, Mr. ——," I shouted, "how do you like the City of the Straits?"

After giving me his local name, he said, with some bitterness, It ain't no city of "flushes," I tell you those. I've only been here a week and I've seen more mirages than I ever did in Chee-waw-waw. Yes, mirages. From a distance I've seen men on the Western Union corner whom I taught the business to, and others that I helped in the South, and when I stepped over to them they had disappeared. No vision of the mind about it; I seed them and proved it. Waiting in the alley about noon I caught one of them with a rope—a man, too, who actually owed me subbing money from Washington; he gave me a nickel on account, told me not to make a beast of myself on it, and when I turned to suppress a smile, the clock struck twelve—he disappeared. Nothing remained where he stood but a gust of cold air.

This evening, getting desperate, I spoke to a knot of operators on the corner and told them candidly that I was on the "hog train." They laughed. One kind looking young fellow rebuked them and suggested that they should send me around to "Bags." After consultation this was agreed upon, and the spokesman told me they were sorry they had no "stand-off" for meals, but were all good for drinks at a place off Woodward Avenue on Cadillac Square. They gave me a note to J. J. Bagley to furnish me six drinks a day for one week and charge to them. Each signed his name. They said that either of the four bartenders would honor it.

What am I kicking about? Why just this: after a breathless search I found the place. It was a drinking fountain with four faucets to it and the name of Bagley, the donator, cut in the stone. You call this city of "Straits," do you? Well, I am going "strait" out of it. I'll take chances in some city of "crooks," I tell you these.

One evening lately I looked up into the sky. I suppose it was because I could not look down into the ground. I must be peering somewhere all the time. There was another cause this night. I was only on the extra list and the aurora borealis got so funny it knocked me out of work, so I looked at the sky more in anger than in sorrow. There was a lot of foolish goings on up there. The giddy Venus seemed to have snatched the bed clothes off Jupiter and was dancing the "rag down" in the northern sky, and as I looked towards the zenith the thought occurred, How like a large telegraph office the firmament is!

There was Arcturus, Vega, Antares, and a few other stars of the first magnitude on duty, assisted by Kohab, Dubhe, Merak and about thirty second class ones. The third and fourth were working the way and city wires. The seventh class I put down as the little check girls, because they were "out of sight." Then, here and there was a conundrum like the star "Alpha" in the constellation Cygnus, ranked A1 by some astronomers and A2 by others.

Poor Alf! Now, he may be a first-class operator with reduced wages from unreliable habits, or a married man whom the officials know cannot leave town and must take any salary. Then, again, he may only be a second rate man who has a pull with the manager and draws the top pay. Who knows?

The planets, like traffic chiefs, were strolling up and down the aisles, borrowing light and other things. The Milky Way, with its struggling multitude of different grades, resembled the Chicago block after the World's Fair, and I saw constellations of bulls, dogs, bears, and especially snakes, but no wolf. Where is the wolf this year?

Then I thought of the comet as a tramp operator, coming from where God and themselves only know. Both phenomena rushing through space without any visible means of support, spacing it all the way with nothing but a big head or nucleus, shocking our whole system with fears at his approach. Will he strike us? Perhaps. Will he burst us? No. Where does he get that light he carries? Stole it.

The word comet is from the latin noun coma, signifying a bunch of hair. When the tramp is in aphelion with a barber a few weeks, his whiskers are more or less coma.

I admit the simile is weak in a few respects. For instance, the comet has no O. R. T. card: the tramp has no tail; the stars are "fixed," the tramp is not; comets have three curves, namely, hyperbola, parabola and ellipse; tramps have only one curve, the elbow. You ask is the comet inhabited? I say no, but the tramp is, as a rule. And another marked dissimilarity is that by approximation some comets will not return for two thousand years, while the tramp operator absolutely refuses to approximate even his departure.

We see, by this lesson, that the word "star," as applied to operators, descends from heaven. Now, where does the appellation "ham" ascend from? To the first person sending the correct answer, and one dollar, I will present them with a complete package of Western Union receiving blanks (form No. 1), and to the second correct reply a new steel falcon pen.

War and the Wires.

BY FREDERIC J. HASKIN.

The wires are making history today at such a rate as it never was made before. Only a century ago it took seven weeks for the news that peace had been made to reach the men that were fighting in America, and Jackson won the battle of New Orleans after the war was ended. Today the President of the United States can send a message to London in five minutes.

Necessarily a sudden, tremendous strain has been imposed upon the nation's facilities for wire communication, especially in and out of Washington. Telephone tolls would seem to be a sensitive barometer of public excitement and governmental activity. When Germany's note declaring unrestricted submarine warfare was delivered in Washington toll traffic out of the capital jumped twenty per cent., and local traffic started on an upward curve. When Ambassador Bernstorff was given his passports on February 3 the volume of telephone talk was further swelled. The local telephone company began working twenty-three hours a day installing new equipment. and revamped its plant from the foundations up.

When war had been declared the Council of National Defense called for the co-operation of the wire companies with the government. Officials of the wire companies went into conference with government officials, and the desired coordination was effected.

The wire companies have undoubtedly rendered a great patriotic service, have done remarkable emergency work in increasing their facilities, and have given the government co-operation of the most willing kind. Long line wires out of Washington have increased from 149 to 300; long distance operators in all parts of the country were quickly increased to twelve thousand, and more are in training. The operator schools at the capital are in session every day except Sunday. A new underground cable between New York and Washington, to cost $1,500,000, is being planned.

Not only the government but the public is making enormous demands upon the telephone company. The local management in Washington has brought in a total of 168 operators from other cities upon its system, and eighty-two from other sources; but the government has taken a total of 225 of its experienced operators. Meantime the number of telephones in the district has increased by six thousand since the first of the year, and Washington now has sixteen telephones for every hundred inhabitants.

Unquestionably the telephone companies are doing their level best, and they are doing well. Furthermore, they have another motive than the pure patriotism which undoubtedly spurs them on. Government ownership of telephone and telegraph lines has been their bogey for many years, and beyond a doubt the service which they give the government and the public during this great emergency will be most closely scanned by the advocates of postalization. The wire companies will point to their record of patriotism and efficiency in the service of the government during the war as proof that they are worthy of control of this vital part of the nation's communications

All of the other principal nations of the world long ago converted the telephone and telegraph into government monopolies. In the belligerent countries the governments, by reason of their monopoly of these facilities, are able to maintain a much closer surveillance over their use. In both England and France the closest censorship is maintained. No one is allowed to speak over the wires except in the language of the country, and then he may be pretty sure that more than one "party" is listening. So that in these countries the public certainly gets a more restricted service than in the United States. On the other hand, the foreign governments run no risk that the wires will be used for the purposes of hostile espionage. [Since this was written the French Government has issued an order permitting the use of the English language on French telephone lines.]

The wire companies are on trial and striving with all of their patriotism, wealth and efficiency to vindicate the trust of the people and the government. Whether or not government ownership ever becomes a fact in this country, its advocates may be given some credit for stimulating this burst of patriotic energy.

Curiously Worn Key Knob.

A curiosity in the shape of a worn and distorted key knob has recently been brought to our attention. The knob was removed from a key used continuously for fifteen years by Mr. W. C. Staib, operator in the general offices of the Lehigh Valley Railroad at South Bethlehem, Pa. Mr. Staib is suffering from operator's cramp and has the use of only one finger in sending. In the course of time his finger wore a deep indentation in the hard rubber, and nearly penetrated it. Besides this his other fingers and the way he handled the knob produced so much friction on the edges as to wear them away and give the knob an eccentric shape.

This knob is a real curiosity and shows the effect of friction when long continued.

The Audion Tribe.

BY DONALD McNICOL, NEW YORK.

At the time Dr. Lee DeForest presented his famous paper entitled "The Audion; A New Receiver for Wireless Telegraphy," before the American Institute of Electrical Engineers, New York, October 26, 1906, there was at least one scientist present who deprecated the tendency to give new names to new devices used to perform mechanical or electrical functions already identified under broad classifications.

In the discussion which followed the presentation of the scientific paper referred to Professor M. I. Pupin said:

"If there must be a new name for each new detector—a new name for everything that comes up in the course of the development of the electrical art—pretty soon the science of electrotechnics will be a maze of new names, and the learning of the names will be much more difficult that the learning of the facts connected with the art. For that reason I am opposed to new names. Although Dr. De Forest is enthusiastic about the elegance of the name audion, I must say that I am not very much impressed by it. It is a mongrel. It is a Latin word with a Greek ending. If he had said acouion, or acousticon, it might have been better, but more difficult to pronounce."

Nevertheless, by all hands, the word audion was taken up as the name given radio-telegraph detectors of the incandescent bulb type.

The purpose of this brief paper is to call attention to how Professor Pupin's fear—that a maze of new mongrel names might be expected to follow—has been realized.

Today the following words are in common use by radio engineers, as the names of devices in appearance similar to and in principle based upon the original audion: Oscillation valve, regenerative audion, kenotron, pliotron, electron relay, thermionic relay, thermo tron, audiotron, amplitron, detecto-amplifier, Moorhead tube, oscillion, ultra-audion, dynatron, oscilaudion and pliodynatron.

It would not be surprising to learn that many students of radio have lost the count, or at least have not been able to keep pace with development, to the extent of having a clear understanding of the features possessed by these various devices which entitle them to a moniker of their own, other than that of plain audion.

The following information is offered to those who wish to add these new words to their vocabularies, together with definitions, somewhat brief, but containing enough of detail to aid one in distinguishing one device from another.

The word audion is derived from Latin AUD, hear, and Greek ION, IANEI, go. The audion, invented by Doctor De Forest, consists of an exhausted glass bulb containing a hot filament and a cold plate, with a grid between these two members. It is used as a detector of radio frequency oscillations. In certain wiring hook-ups it is called an electron relay, and with certain circuit arrangements it may be employed as an amplifier of electric impulses.

FLEMING OSCILLATION VALVE. This device, invented by Dr. J. A. Fleming, of University College, London, is similar to the audion, being based upon the emission of electrons from a heated filament in vacua, but differs from the audion in that it contains only two elements, a carbon or tungsten filament surrounded by a nickel or copper cylinder.

When the filament is made incandescent by current from a low voltage storage battery, negative electricity may pass from the filament to the cylinder, but not in the reverse direction. When, therefore, the terminals of a radio receiving circuit are connected to the wire entering the bulb from the negative pole of the battery, and to the terminal attached to the metal cylinder, the radio-frequency currents flowing in the receiver circuit are converted into uni-directional current of a character which will actuate the diaphragm of a telephone receiver.

REGENERATIVE AUDION. The word regenerative as here employed has reference particularly to an arrangement of circuits using an ordinary audion whereby the radio-frequency and audio-frequency currents are simultaneously repeated back to the grid circuit, resulting in pronounced amplification of the received signals.

THE KENETRON. Name derived from Greek KENOS (empty space), vacuum, and Greek TRON, instrument. This device was developed by Dr. Saul Dushman, of the General Electric Company. In general design the device resembles the audion, but the exhausted bulb contains a filament and two plates, one of which, in action, is maintained at a high degree of heat from a local battery source. When an alternating current is applied to the plates or electrodes, current will pass from the heated plate, when the latter is the cathode, to the other plate, while no current will flow in the reverse direction. The device, therefore, is a rectifier, accomplishing the same ends as mercury arc or electrolytic rectifiers.

A molybdenum cap type of kenotron is used for voltages up to 10,000, and the filament two-plate type may be used for higher voltages.

Current strength through the kenotron is quite stable, and two or more instruments may be used in parallel, each taking its share of the total current.

In radio-telegraph work the kenotron is used to rectify audio frequency and radio-frequency currents.

THE PLIOTRON. This also is a General Electric Company device. It consists of a highly exhausted two or three-element bulb of large dimensions, and may be used for amplifying radio signals, or for generating current at audio or radio-frequencies. The three elements consist of tungsten filament, tungsten grid and tungsten plate. In certain forms of the device the grid is made up of very fine wires, 0.01 m. m. thick, and spaced 100 turns per c. m.

The larger sizes are used for controlling 1 K. W. of energy for radio telephone transmission. By placing inductance and capacity in the grid and plate circuits and coupling these two together the pliotron may be used as a source of continuous oscillations.

THE ELECTRON RELAY.—As previously stated, the original audion acts, in a sense, as an electron relay, but the particular instrument which amateurs know by this name is manufactured by the Moorehead Laboratories, in San Francisco, Cal. The operation of the device is based upon the pure electron current flowing between a hot cathode and a cold anode; the flow being controlled by a spiral grid.

As manufactured by the Moorehead Laboratories, the electron relay is in the form of a tube containing two filaments in straight lines, which are completely surrounded by a copper spiral, the spiral or grid in turn being entirely surrounded by an aluminum plate in contact with the wall of the tube. It oscillates on any wave length, and is a combination of detector, amplifier and oscillator.

THERMIONIC RELAY. This name is sometimes given to any of the devices of the audion type, based upon the flow of thermionic currents from hot filaments placed in vacua.

THERMO TRON. Sometimes known as the "Roome" thermo tron, manufactured by The Thermo Tron Company, Los Angeles, Cal. In appearance practically the same as the electron relay previously described.

AUDIO TRON. Another name for any of the devices herein described.

AMPLI-TRON. Name applied to any instrument of the audion or valve type when used as an amplifier of radio signals.

DETECTO-AMPLIFIER. This device, otherwise known as the Tigerman detector, advertised for sale by the National Electric Manufacturing Company, Chicago, is of the tubular type, and may be used as a detector, one-step or two-step amplifier, or as an oscillator. The principle of operation is the same as that of the other devices herein described.

MOOREHEAD TUBE. The same instrument referred to as the electron relay.

THE OSCILLION, or OSCILLATING AUDION, is the name given by Doctor De Forest to the type of instrument developed and manufactured by his company and used as a generator of undamped oscillations of any frequency from 60 to 1,000,000 per second, representing from a few hundredths watt output of energy, up to one-half ampere at radio voltages.

ULTRAUDION. A name applied by Doctor De Forest to certain circuit arrangements in which the audion is employed.

DYNATRON. Name given to a General Electric Company development in vacuum tube amplifiers and oscillators, in principle depending upon secondary thermionic current transmission. As manufactured the bulb contains a filament, a perforated plate anode, and a plain plate. The perforated plate or grid is maintained at a fixed, relatively high positive potential. The device is similar to the kenotron, but by means of higher plate voltages greater electron velocity is obtained.

Used as an amplifier the dynatron yields voltage amplifications as high as one thousandfold. As an oscillator the instrument produces frequencies from one cycle per second to 20,000,000 cycles per second (corresponding to a wave length of fifteen meters). One hundred watts output of energy has been obtained from a single bulb.

PLIODYNATRON. This is the name given by Doctor Hull, of the General Electric Company, to a device developed by him, which is a combination of the pliotron and the dynatron. It is a four-element device and resembles a large X-ray tube.

OSCILAUDION. This is the name given by Harry V. Roome, of Los Angeles, to a detector of the tubular type, resembling the electron relay, and the thermo-tron, previously referred to.

After reading the foregoing, is it any wonder that Doctor Pupin was perturbed over the advent into the electrical art of new and mongrel names? When Doctor De Forest coined the word "audion" he pulled the bung from a barrel which contained a vast and venerable assortment of Greek and Latin derivatives, and it is evident that these have been industriously raked up and picked over to supply bewildering additions to our already involved scientific vocabulary.

It may be that when the courts get through with the patent cases under way and prospective, there will be need for fewer distinguishing names for radio receivers. In this connection it is interesting to point out that ten years after the Morse telegraph was invented, what we now universally know as a "Morse relay" was variously termed the axial telegraph, axial telegraph with clockwork, axial telegraph with engine, reciprocating telegraph, axial receiving magnet, et cetera.

Telegraph and Telephones in the Malay States.

According to official returns there were, on September 21, 1916, 2,210 miles of telegraph and telephone lines and 10,461 miles of overhead wires in the Federated Malay States. Of this mileage 7,914 miles were used for telephone service. The revenue derived from telegraphs last year was $102,031, an increase of $27,244 over 1915, and the revenue from telephones in the states for 1916 was $109,457, being an increase of $8,792 over the previous year.

Telegraph and Telephone Age Appreciated.

Mr. W. C. Lloyd, superintendent of the Postal Telegraph-Cable Company, Birmingham, Ala., in a letter recently sent to the managers of the offices comprising his district had this to say concerning this publication:

"I would again call your attention to that excellent telegraph paper, TELEGRAPH AND TELEPHONE AGE. It is issued twice per month from New York and the price is $2.00 per year.

"Each issue is chock full of good, instructive reading matter, and the technical articles alone, written by experts, are many times worth the price of the paper.

"No telegraph manager or employe, who is ambitious to increase his knowledge and get along in the business, can afford to be without or not to read this excellent publication. I would like to see every employe in this district a subscriber to and reader of TELEGRAPH AND TELEPHONE AGE."

Mr. Gaunt to District Commercial Superintendents.

In his address before the meeting of district commercial superintendents in Chicago, on October 3, Mr. C. H. Gaunt, general manager of the Western Division of the Western Union Telegraph Company, gave utterance to some very important Efficiency Engineering truths that are well worth reproducing in this journal. Among other things he said:

When we get together in this way the feature of the meeting that is of most value is, in my opinion, that it provides an exchange of thought and individual talent among all of those assembled. In a group of people there must be some who have better opinions on one subject than the others may have. Conversely, those others may each have better opinions on another subject than the first. Close association in a meeting ought to develop the very best opinions of each. In other words, we should learn from one another. That, to me, is the best reason for calling together a lot of officers of a company.

There are a lot of subjects in connection with the telegraph business that are a great deal like oysters, as one must handle them roughly in order to get the good out of them. And I have found this: that it is difficult to present new facts without offending old theories and errors. I think that is largely because of the personal view that many people take of all changes; they are rather prone to regard any argument that conflicts with their opinion as an attack on them personally. I don't think that we should mind being reversed or convinced against our opinions. There is no onus in giving in, if you have been wrong in your opinion, and there is this about it, so far as you folks are concerned, that in a group of officers whose reputations for achievement are so rich in credits as are yours, it is perfectly permissible to occasionally have a red ink entry.

As officers of the company we must stand between it and the public in both a protective and a helpful way, and between the company and its other employes in the same way. We cannot successfully exploit the company at the expense of the public, nor ourselves as individuals at the expense of either.

I believe that the widest avenue for the promotion of friendship between the company and its workers, the mutual advantages of which are so obvious, lies in our officers standing in their minds for something more than the taskmasters of routine, the Simon Legrees of discipline, or the Quilp of amenities. All of these attitudes are prodigal of the physical and nervous resources of the company's man power, conducive, I question, even to mere dexterity in mechanical manipulation, seemingly only productive of speed and low costs, but in reality neglectful of the greater saving and freedom from penalty which comes with speed and low cost only when combined with that greater than all factor—accuracy, to be expected only as an accompaniment of the harmonious relation between the workers and supervisory forces, the result of bonds of friendship engendered by the thought in the minds of the former that those with whom they have next to deal stand for something valuable and good in their own lives.

The growing demands of public service and the instant demand of governmental war service, coupled with the depletion of the company's forces in our country's need, has placed a burden upon us as officers, as well as an added responsibility upon each worker in the company's service, for such a character of war duty as will place the transmission of intelligence for the government and for industrial concerns engaged in war work far above the criticism of reproach. There is no more fruitful or satisfying field through which individual loyalty to the United States Government can at the present moment be exercised or made manifest than through the proper performance of the telegraphic function of the country by employes of this company, upon whom has now fallen responsibility for secrecy, accuracy, expedition and "win-the-war" effort; responsibility of seeing that the service does not break down in this crisis—a patriotic duty second only to that expected of those who go to the front.

It brings to my mind the thought that has always been uppermost with respect of good administration. Each one of you gentlemen has under your authority a large number of employes. This authority is exercised directly and through semi-officials, such as the district commercial managers and the managers of offices, chief clerk, cashiers, claim clerks and delivery clerks and others. Besides this direct departmental line authority you have in addition the privilege of exercising great influence among other officers and employes, because of attractive personal characteristics and the standing accorded to your official positions, and because of the value and helpfulness to them of your coöperation and assistance. It is along the line of helpful assistance, guidance and advice that we should exert ourselves with others, feeling that we are most responsible field heads of the company, representing it with the public and steering it through its activities.

This all leads me to another thought prominent among my ideas of good organization and proper administration. Considered as individuals, no single one of us can directly do very much. Individuals have but one pair of hands, one set of eyes and ears, and one brain. It is to be supposed that when a question comes personally to a principal officer—to a superintendent, for instance—that the very best action will be taken. The company has hired the talent and rightfully expects the result. But as individuals we have not the bodily spread or the time to pass personally upon a large number of matters; therefore we must delegate to many others various phases and lines of responsibility and the authority to do the things that we cannot personally do because of our inability to extend ourselves over so large a field. The ability to wisely —I repeat, wisely—delegate authority and power, to my mind, is the most valuable single business asset. I say that, far removed from the thought of unloading anything that others may do for us in order to save ourselves the trouble. I say it in a much higher and broader sense of desire to have you folks multiply your talents among your sub-officers. A good organization is so ordered that any member before whom there shall come an important question for decision will decide that question exactly as it would be decided by his superior officer, should it come before the latter. That is the only good organization. There is and can be no better, because, without that, everything must go to the supreme head for proper decision, and the stream is choked at its source. What we want to get is correct decision in the field—decision that is proper and effective.

Now, where you come in on that kind of organization is this: That while it is not possible for you to pass upon all things yourselves, because there are too many of them, you can, nevertheless, review the work of the many and take remedial action against the individual who makes an occasional error. When you find a defection you can sometimes even prevent it, or save the company harmless from its effects. But your own absorption in infinite detail will surely prevent your review of the work of the many. I am coming to judge you largely by your ability to secure proper action from your subordinates and not from the excellence of your own personal acts in relation to detail.

Items of General Interest.

INTERFERENCE OF LIGHT.—Two waves or vibrations of light may be made to interfere and produce various colors, or entire darkness, just as two sets of sound waves or vibrations may be so combined as to modify or destroy each other.

FACTS ABOUT OUR BODY.—The number of teeth in an adult's head is 32. The heart sends nearly ten pounds of blood through the veins and arteries each beat, and makes four beats while we breathe once. The weight of the circulating blood is twenty-nine pounds.

USEFUL RULE FOR MAKING CHANGE.—A useful short cut to subtract any two figures from 100, is to subtract the first figure from 9 and the second figure from 10. For example, subtract 35 from 100. Three from 9, leaves 6, and 5 from 10 leaves 5—65. This is very useful in making change for one dollar.

SEAL ON OUR PAPER MONEY.—The seal which appears on the paper money of the United States is a relic of the days antedating the Constitution. The words abbreviated are "Thesauri Americana Septentriomalis Sigillum," which mean, in English, "Seal of the Treasury of North America." The abbreviations used on the seal are "Thesaur. Amer. Septent. Sigil."

TRADE SECRETS.—Here is a chance for inventors. The art of making the coloring material known as Chinese vermillion, and of inlaying gold and silver in hard steel, are unknown to the world outside of those in possession of the secrets. These secrets have been handed down faithfully from one generation to another for hundreds of years and apprentices must swear to an ironclad oath to reveal nothing of what takes place in the workshop.

FINE DIVISION OF MATTER.—The extent to which matter can be divided and yet be perceived by the senses, is most wonderful. A grain of musk has been freely exposed to the air of a room, of which the door and windows were constantly kept open for a period of two years, during all of which time the air, though constantly changed, was densely impregnated with the odor of musk; and yet at the end of that time the particle was found not to have greatly diminished in weight.

CONVERSION OF KILOMETERS TO MILES.—Wireless telegraph transmission distances are often stated in kilometers, nautical miles or statute miles. To convert the number of kilometers to nautical miles, multiply by fifty-four and point off two decimal places. To convert from kilometers to statute miles, multiply by sixty-two and point off two places. If the distance is given in statute (or land) miles and it is desired to express it in kilometers, multiply the number of miles by 161 and point off two decimal places.

More Thirty-fifth Anniversary Congratulations.

Congratulations on the thirty-fifth anniversary of this journal, in addition to those previously printed, have been received from Geo. M. Eitemiller, the old-time brilliant telegrapher, again in the service during the war period at Kansas City, Mo.; T. V. Field, equipment engineer, Chicago Telephone Company, Chicago; J. C. Barclay, formerly assistant general manager, Western Union Telegraph Company, now director, Board of Commissioners, Montclair, N. J.; C. M. Baker, general superintendent of plant, Postal Telegraph-Cable Company, Chicago; Chas. Vollertsen, chief operator, Western Union Telegraph Company, El Paso, Tex.; Thos. S. Brickhouse, of San Diego, Cal., winner of the Carnegie Diamond Medal at the San Francisco Tournament, 1915; James B. Yeakle, superintendent fire telegraph, Baltimore, Md.; Geo. D. Perry, general manager, Great North Western Telegraph Company of Canada, Toronto, Ont.; Stephen E. Barton, an old-time and Civil War military telegrapher, now and for many years in the insurance business at Boston, Mass.; John S. Craig, superintendent of fire telegraph, Toronto, Ont.; W. H. Canniff, formerly president of the Nickel Plate Railroad Company, now retired and president of the Old Time Telegraphers and Historical Association, Cleveland, Ohio; T. J. Hoge, Postal Telegraph-Cable Company, Pittsburgh, Pa.; W. B. Eddy, New York Telephone Company, Albany, N. Y.; H. F. Taff, general superintendent, Western Union Telegraph Company, Washington, D. C., and H. J. Jeffs, division traffic supervisor, Western Union Telegraph Company, San Francisco, Cal.

New Censorship Rules.

President Wilson, in a special order, has entrusted the censorship of mails, cablegrams, radio and telegraph communications to a board including representatives of the Post Office, War and Navy Departments and the export administration. The Navy Department censors cablegrams and the War Department telegraph communications to Mexico.

Efficiency Engineering in the Telegraph Service.

(Continued from page 479, October 16)

We are often reminded that the most important department of a telegraph equipment is the delivery service. This is not true. All departments are equally important, one just as much as another. It is true that much depends upon the messenger service in rendering efficiency. Is it not equally true that the operating department must perform its work satisfactorily? As a matter of fact, there should be no lagging in any of the departments that go to make up a telegraph office.

In a recent communication sent to the managers of the Gulf Division by Mr. S. M. English, general manager, Western Union Telegraph Company, Dallas, Texas, he makes some pertinent observations that are worth printing and remembering. He says, in part:

Some men have positions that are too big for them, while other men are too big for their positions.

When these conditions are real the first man should study hard and grow to his position in the many ways suggested and in the many other and better ways followed by successful men. The other man will soon be discovered and placed where he can serve to his full capacity.

But when the latter condition exists only in the man's imagination and he can't prove it to his superior officials, he is in a bad fix and needs a good, hard jolt to set him right; to awaken him to the importance of not only filling his position, but filling it until it overflows with good work and results.

We can only advance when we really outgrow our present places and no man can outgrow his position who leaves undone any of the work pertaining to it.

The telegraph service is improved only by those who more than fill their present places.

If no one quite filled the position he occupied we would all go backward, together with the company we represent.

If all of us just do fill our positions, we will stand still.

We would soon ruin the progressive road to advancement by following the rut.

Those who do not quite fill their appointments must be carried along as so much dead weight, at great expense, by the others.

The progress of a company is retarded only by those who do not keep up with the procession; who are content to do their work as it was done ten or more years ago.

Every day is either a successful day or a failure, and it is the successful days only which get for us what we want. If every man failed every day we would soon go backward. If every day is a successful day, as most of them now are, we will continue to grow in popularity and prosperity, a share of which all of us will enjoy, since we are the company we represent.

It is really not the number of things you half do, but the efficiency of each separate action that counts.

Every act is, in itself, either a success or a failure.

Every act is, in itself, either efficient or inefficient.

Every inefficient act is a failure, and if you spend your time in half doing things, all of your days will be failures.

If there is something that should be done today and you do not do it, or, if you do, and you do not do it well, you have failed in so far as that thing is concerned, and the consequences may be more far reaching and disastrous than you imagine.

You cannot foresee the results even of the most trivial act; much may be depending on your doing some simple thing; it may be the very thing which is to open the door of opportunity to very great possibilities. Your failure to do some small thing well may discredit you and retard your progress.

You are not expected to overwork, nor rush blindly into the effort to do the greatest possible number of things in the shortest possible time. Accuracy first forbids. Neither are you to try to do tomorrow's work today or tonight.

Believing "the sins of the father shall be visited upon the children even unto the third and fourth generation," as all of us should, some men apparently think it applies to those who have gone before us in the telegraph service, and that we must continue certain bad practices as a matter of heredity. Why not switch to this thought: "I should be ashamed to acknowledge that I am not a better man than Dad, with all the advantages he has given me and which he did not himself enjoy."

(To be continued)

Civilian Trades in the Army.

The Quartermaster Enlisted Reserve Corps, with recruiting headquarters at 357 Broadway, New York City, have received a new authorization to enlist men to follow their civilian trades in the army, for duty in this country and abroad.

The men particularly needed at this time are, electricians, tinsmiths, iron workers, carpenters, plumbers, mechanics — auto mechanics — general masons, bricklayers, farriers, horseshoers, saddlers, blacksmiths, teamsters, cooks, chauffeurs, stenographers, wagonmasters.

Enlistment is open to citizens of the United States, or to those men who have declared their intentions of becoming citizens. They must be between the ages of 18-45 years and have no one depending on them for support.

The enlistment in the Quartermaster Corps is for qualified men, and military training as a soldier is not required in this branch of the service. They do not have to drill with rifles, perform guard duty or other purely military duties, which fall to the lot of soldiers of the infantry, cavalry and other branches of the army, except in cases of emergency.

Applicants will be received at the Quartermaster Corps recruiting station, 357 Broadway, New York City, and the recruiting officer will be glad to give any further information on the subject of enlistment.

People take you at your face value. If you whine, you are taken as a failure; if you smile and act like a winner, you will in time become one.

FOR CLEAR
TRANSMISSION

EDISON PRIMARY BATTERY DIVISION
THOMAS A. EDISON, Inc.
30 Church St., New York, N. Y.

HALL SWITCH AND SIGNAL CO.
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MANUFACTURERS OF THE

GILL SELECTOR

THE UNIVERSAL SELECTOR
FOR TELEGRAPH AND TELEPHONE

Out of the experienced past, into the exacting present, KERITE through more than a half-century of successful service, continues as the standard by which engineering judgment measures insulating value

DAYS KERITE

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO

THE RAILROAD.

Meeting of Eastern Division.

The Eastern Division of the Association of Railway Telegraph Superintendents will hold a meeting Thursday, November 22, in the East Room of the La Salle Hotel in Chicago, Ill., at 9:00 a. m. After a brief session for the consideration of matters pertaining to the Eastern Division, the meeting will merge with the special meeting of the association, called by President M. H. Clapp, as announced in our October 16 issue.

Mr. W. P. Cline, superintendent of telegraph, Atlantic Coast Line, Wilmington, N. C., is chairman of the Eastern Division.

MR. GEO. B. KING has been appointed telegraph and telephone inspector of the Southern Pacific Railroad Company, with headquarters at San Francisco.

MR. H. WILSON, telephone inspector of the Great Northern Railway Company at Great Falls, Mont., has joined an engineering corps and has left for railroad service in Russia.

Printing Telegraph on Lackawanna Railroad.

The Lackawanna Railroad Company has installed and put into operation two printing telegraph instruments made by the American Telegraph Typewriter Company between the offices of the traffic manager, located in New York, and the car service superintendent in Scranton, Pa., a distance of 150 miles. These instruments are used in connection with the freight clearing house system recently adopted by the Lackawanna Railroad. The printing system is proving to be very successful, and it has relieved the telegraph department of this class of traffic.

New York Central Training School.

In order to train young men and women to fill the many desirable positions now open, the New York Central Railroad is now offering practically free instruction which would enable students to qualify as practical telegraph operators and obtain desirable positions at good salaries.

At the railroad school young men and women will be taught practical railroad work. A thorough course will be given in telegraphy, handling of train orders, blocking of trains, typewriting and general clerical work such as is necessary in connection with the freight and ticket traffic at stations. Young men who desire it will be instructed in interlocking and block signal work.

As an evidence of good faith, students are required to pay an entrance fee of $2.00 and $1.00 per month, all of which will be refunded to the students when they qualify and accept positions with the New York Central Railroad.

New York Central Railroad schools are now located at Buffalo, Albany, Utica, Rochester, Corning and Kingston; additional schools will be established at other places in the near future.

THE ASSOCIATED PRESS.

Printing Systems on Associated Press Wires.

The Morkrum printer is used by the Associated Press to distribute the news among the various newspaper offices in New York City and Pittsburgh, and between Chicago, Milwaukee, St. Paul and Minneapolis. The distance between Chicago and Minneapolis is 450 miles. The Western Union multiplex system is used to distribute press reports between New York and Boston, 240 miles, with drops at New Haven, Hartford, Springfield, Worcester, Providence, and Boston as the end of the circuit. These printing systems are giving satisfaction and there is no doubt but that the installations are permanent. Notwithstanding these automatic circuits the Associated Press is now employing more operators than ever.

Long Circuit.

During the World's Series baseball contest the Associated Press had its entire system of leased wires looped together at the various centers, so that the sending operator at the baseball grounds communicated directly with every newspaper served by the association. The mileage of the circuit was approximately 30,500 miles, or 500 miles longer than that of a year ago.

INDUSTRIAL.

The J-C Repeater.

The high cost of battery materials has turned the attention of telegraph and railroad companies toward meeting the difficulty, and the only practical way of doing this seems to be by eliminating the battery altogether.

The J-C Repeater is a batteryless repeater, simple in construction, simple in adjustment, and gives certain results. It is used by the War Department and the principal railroads.

A descriptive bulletin will be sent to anyone interested by applying to the Jester-Cooper Company, Houston, Tex.

Advertising for this Publication.

TELEGRAPH AND TELEPHONE AGE is a splendid medium in which to advertise, and we wish those who have anything to bring before the readers of this journal to take advantage of our facilities to describe what they have to sell. Our publication has been doing a useful service to its subscribers for thirty-five years and it ought to be a valuable advertising medium for those who wish to reach the telegraph, the telephone, or railroad telegraph professions.

We hope our friends will bring the value of this paper as an advertising medium to the attention of those who have need of our exceptional advertising facilities. Statement of circulation, advertising rate cards and sample copies will be mailed on application by addressing John B. Taltavall, publisher, TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are, "American Telegraphy," by Wm. Maver, Jr., "Radio-Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

THE ELECTRIC GENERATOR.

It is evident that machine A must furnish a larger amount of current than any of the other machines, since it supplies a share of the current furnished to the wires from the second, third and fourth potentials, as well as all the current supplied to the wires drawing from the first potential. This it does, owing to its low internal resistance, which is about one-ninth of an ohm, without any appreciable variation in the strength of current furnished the wires, regardless of whether but one or several hundred wires are being "fed."

The resistances R, R,, etc., are of German silver wire coiled around a cylinder of plaster of Paris. Each coil rests on a plate of metal, to which the wire leading from the generator is attached. One of these coils is inserted in the circuit of every wire. The function of these coils is to diminish the current strength, thus avoiding sparking at keys, etc., in cases of short circuiting.

As in the operation of the polar duplex and the quadruplex system it is essential to have reversals of electric polarity, and as it is not practicable, when a machine is furnishing electromotive force for a large number of wires, to reverse the generators, means to provide for this essential must be devised.

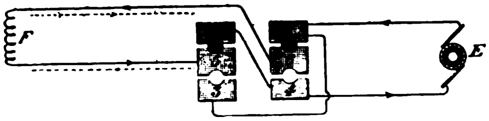

FIG. I—GENERATOR REVERSING SWITCH.

This is accomplished by operating two series of five generators each, one of which series is caused to furnish positive polarity, the other series, negative polarity. To guard against failure of one of the series, a third series of five machines is held in readiness as a "spare." The conversion of the spare series into a negative or positive polarity can be readily accomplished by placing a reversing switch in the field magnet circuit of the machines, since a change in the direction of the current through the field magnet coils will result in a change in the magnetic polarity of the field magnet, which change will, in turn, by reversing the direction of the magnetic lines of force in the field, reverse the direction of the current generated in the armatures of the machines A. B. C. D. (Fig. 1, October 16) the direction of the current through E, of course, remaining uniform.

Such a switch is outlined in Fig. 1, in which E is a generator and 1, 2, 3, 4, 5, 6, are metal discs. With the plugs as shown, the current through the field magnet circuit F is as indicated by the solid line arrows. With the plugs inserted at 3 and 4, instead of at 1 and 2, the current in the field magnet circuit would flow as shown by the dotted line arrows.

(To be continued)

QUESTIONS IN TELEGRAPHY

Why does machine A (in Fig. 1, October 16 issue) furnish a larger amount of current than does any of the other machines?

Why are resistance coils inserted in the circuit of every wire?

How are currents of positive and negative polarity supplied to wires, and what protection is provided against a break down?

Telephony.

RETARDATION COILS IN TELEPHONE CIRCUITS.

A retardation coil consists essentially of a coil of insulated wire wound around an iron core and provided with suitable terminals. The coil is often placed in an iron shell, which serves to protect it from mechanical injury, and which prevents magnetic interference with adjacent telephone apparatus. Fig. 1 shows the principal parts of a standard retardation coil and gives a fairly good idea of how these coils are constructed.

The electrical effects of a retardation coil are, in general, exactly opposite those of the condenser. For example, the condenser prevents the flow of direct current, while the retardation coil offers merely a slight resistance to direct current, such as would be offered by a similar amount of straight wire. The condenser allows alternating current to pass through it, and its impeding effect on the alternating current decreases as the frequency or rapidity of the alternations increases. The retardation coil, on the other hand, has a retarding effect or impedance on alternating current which increases as the rapidity of the alternations increases, and which becomes very high at frequencies corresponding to those of the human voice. In short, the retardation coil provides a path for the flow of direct current, at the same time offering a very high impedance to the flow of alternating current. The various functions which the retardation coil per-

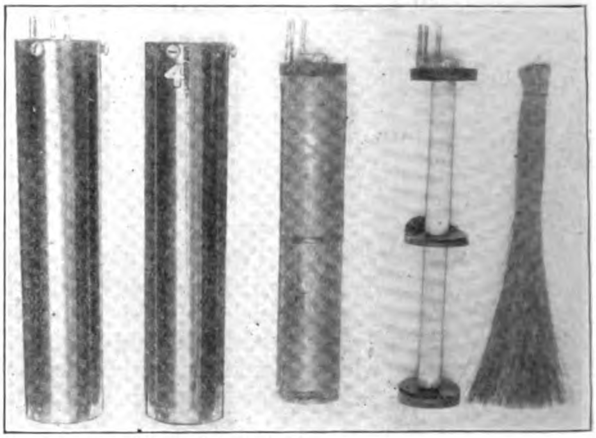

FIG. 1—PRINCIPAL PARTS OF STANDARD RETARDATION COIL.

forms in telephone circuits make use of both of these properties.

(To be continued.)

QUESTIONS IN TELEPHONY.

What are the essential elements of a retardation coil?

Why are retardation coils sometimes encased in an iron shell?

What are the electrical effects of a retardation coil, and of a condenser?

Radio Telegraphy.

TRANSMITTING CONDENSERS—*Continued.*

In Fig. 1 is shown a closed oscillating circuit, with three condenser jars connected in parallel; that is, the three outside coatings are connected together as one terminal and the three inside coatings as the other, and with a potential of 20,000 volts between the terminals. When the condensers are thus connected in parallel the total capacity is the sum of all the capacities; if the condensers are all of equal capacity, the total capacity is the capacity of any one condenser multiplied by the number. Thus in Fig. 1, if each condenser were a jar of capacity 0.002 M. F., the total capacity would be 0.006 M. F., or three times 0.002 M. F.

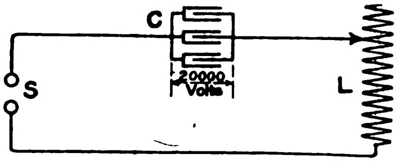

FIG. 1—CLOSED OSCILLATING CIRCUIT.

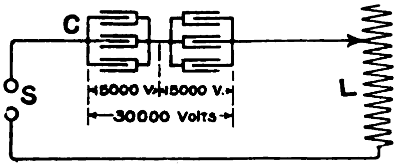

FIG. 2—CONDENSERS IN SERIES.

If the condensers break down at this potential or if higher potentials, such as 30,000 volts, are to be used, two banks, each of three jars in parallel, should be connected in series, as shown in Fig. 2.

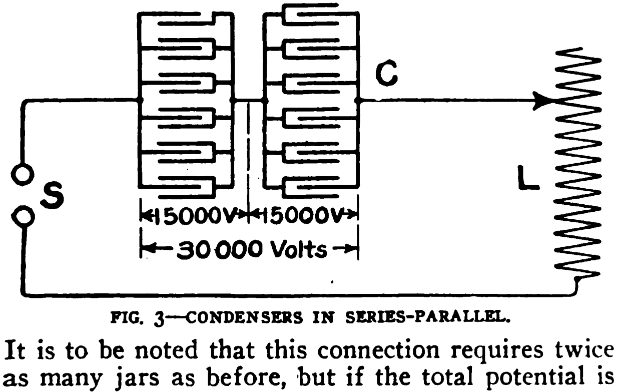

FIG. 3—CONDENSERS IN SERIES-PARALLEL.

It is to be noted that this connection requires twice as many jars as before, but if the total potential is 30,000 volts, the potential across each jar is now only 15,000 volts instead of 20,000 as before. Whenever condensers are connected in series, the total capacity is always reduced; if two equal condensers are so connected, the total capacity is one-half the capacity of either; if three equal condensers are so connected, the total capacity is one-third, etc. As the connections shown in Fig. 2 reduce the capacity to one-half the desired value in Fig. 1, two banks each of six jars must be connected in series-parallel, as shown in Fig. 3, thus requiring four times as many jars as the first circuit.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY

How are the coatings of condenser jars connected in order to work in parallel?

If the condensers are of equal capacity, how is the total capacity calculated when they are connected in parallel?

When condensers are connected in series, how are their combined capacities ascertained?

The Western Union Multiplex.

MULTIPLEX PRINCIPLE.

The equal-letter code permits of the use of the multiplex principle, which is employed in the quadruple duplex, triple duplex, double duplex, and two-way methods of operation. For the sake of explanation, we will consider the quadruple duplex as an example of the multiplex idea. We can further simplify the illustration by omitting the duplex feature and thus consider that we have four channels working in one direction. Fig. 8 shows diagrammatically the method employed to secure multiplex operation. If two metal rings, one at each station, X and Y, are each divided into four quadrants, A B C and D at station Y, and A^1, B^1, C^1 and D^1 at station X, and have rotating brushes E and E^1 connected to the line as indicated, and if the contact brushes start from the same relative position and sweep over the contact segments with the same uniform angular velocity, quadrant A will be connected through the line with quadrant A^1, quadrant B with quadrant B^1, quadrant C with quadrant C^1, and quadrant D with quadrant D^1, once per revolution, the interval of each of these four connections being equal to the time of one-quarter of a revolution of the rotating brushes. If each signal consisted of one pulse of current, it would then be possible to send one signal per quadrant per revolution. If instead of having solid quadrants, they are each divided into five segments, it will be possible to use the five segments of one quadrant at one end for the transmission of five current impulses, which constitute the signal for a given letter or figure in the code just described, and the five segments at the other end may be used for receiving these impulses and distributing them in such a manner

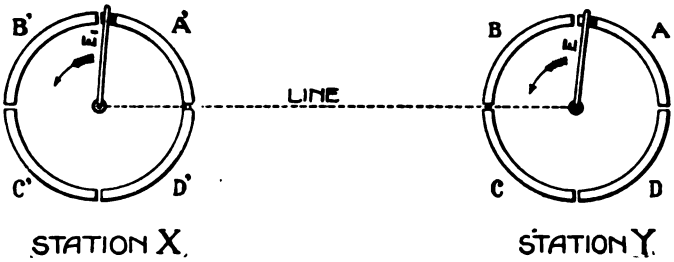

FIG. 8—HOW MULTIPLEX OPERATION IS SECURED.

that they may be used to select the letter determined by the combination of impulses. In Fig. 9 the quadrants are shown thus divided, each quarter of the circumference consisting of five segments, each segment of quadrant A, station Y, being connected to a contact lever so arranged as to connect this particular segment with ground circuit or battery, depending upon its position between the fixed contacts, while the segments of quadrant A^1 at station X are connected to relays as shown. Normally all of the levers 1, 2, 3, 4 and 5 are in engagement with contacts connected to the ground. If, now, any lever is moved over to engage its battery contact during the quarter of a revolution in which the rotating brush E moves over the quadrant A, a current impulse will be transmitted to the line through the rotating brush E, and since the rotating brush E^1 is synchronously wiping over the segments 1^1, 2^1, 3^1, 4^1 and 5^1 at the same time that the rotating brush E wipes over its contact 1 to 5, the corresponding relay at station X will be momentarily energized. Thus, if levers 1 and 3 are moved over against their battery contacts while the rotating brush E at station Y wipes over the contacts of quadrant A, relays 1^1 and 3^1 at station X will receive current impulses, and if all the levers 1, 2, 3, 4 and 5 are held over against their battery contacts, all the relays 1^1, 2^1, 3^1, 4^1 and 5^1 would receive impulses. Now, if provisions can be made to change the combination of levers during the time that the brush sweeps over the other three quadrants, it will be seen that during each revolution a different signal can be sent from quadrant A to A^1. What has been said regarding quadrants A and A^1 applies equally to the other quadrants. Thus it will be seen that the multiplex principle permits of sending and receiving four character signals per revolution. As will be explained, in actual operation the functions of the levers at the sending end, station Y, will be performed by the transmitter, and it will be explained that the operation of the five relays 1^1, 2^1, 3^1, 4^1 and 5^1 is utilized in the printer to select the predetermined letter or figure. It will also be understood that by dividing the ring into a different number of segments, it might be possible to send and receive a greater or lesser number of signals per revolution; that is, if ten segments were used, two signals each consisting of five impulses could be transmitted and received per revolution, or if thirty segments were used, six signals each consisting of five unit impulses could likewise be transmitted and received. The exact method employed for setting up the various combinations of impulses at the sending end, and for receiving and utilizing these current combinations in order to select the proper letters to be printed at the receiving end of the line, will be explained later. What has just been described constitutes multiplex operation. If the line is worked duplex, the same can be accomplished in both directions at the same time, and we then have described the fundamental operation of a quadruple duplex, a triple duplex, and a double duplex.

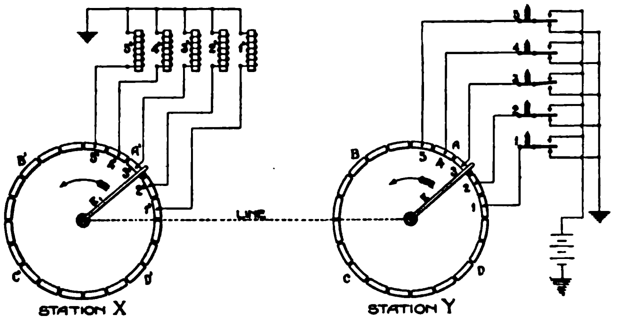

FIG. 9—DIVIDED QUADRANTS.

(To be continued)

Shop Talk.

BY THE OBSERVER

In a previous article, we mentioned some facts relative to the up-keep of selectors, and as we view those great sentinels, we feel that it is hardly possible to say too much in their favor. Therefore, it is suggested here that, regardless of the number of selectors you may have in service, if you find there is need for additional ones make the fact known to the proper authority, giving your reasons and asking for the installation. Never pass up these cases without an effort to secure the selector, as the maintenance is so simple and the results so helpful, that were one to fail in such a case, he would be increasing rather than decreasing labor.

Suppose we take the case of the selector as installed upon a concentration unit and that the lamps do not glow when the combination is made, what should be done if selector sets have no light? Be sure your fuses and voltage are O. K., then hold the selector and see if the contact points are in closed positions. If all this is O. K., you may take a piece of wire and short circuit the two contact posts of the selector. If the lamps glow, the trouble is in the contact points of the selector; if not, then either one or both signal lamps may be burnt out. Take one out at a time and test it. If O. K. replace it, but if open put in a new lamp. By using the tools obtainable upon requisition you can remove the signal lamps easily. There is small chance for such trouble to be anywhere but in the lamps, if you make the test as suggested, it being understood you are certain the fuses and voltage are O. K. before you go further. If necessary to go further into the test use your blue print for proper guidance.

By shorting the local posts of the selectors installed on duplex repeaters you can tell at once if your signal relay is adjusted correctly; in other words, if the entire lamp circuit is O. K. In view of such simple tests, no one should look upon the selector as a mysterious piece of mechanism.

It may happen sometime where there are a large number of selectors in service that some of them will show peculiar symptoms. If such is the case, I would suggest that you number them 1, 2, 3, etc.; keep a log as to trouble; date cleaned, and enter anything special. In this way you will be able to apply the remedy much easier than if you merely "shoot trouble" at random. Keep a supply of signal lamps in stock, as they burn out sometimes.

(To be continued)

Electrolysis.

(Continued from page 477, October 16)

Recording Data.—Inasmuch as the protection of cable and tube systems from electrolytic corrosion requires frequent inspections and continued watchfulness, it is important that all data collected and tests made be recorded in a permanent form.

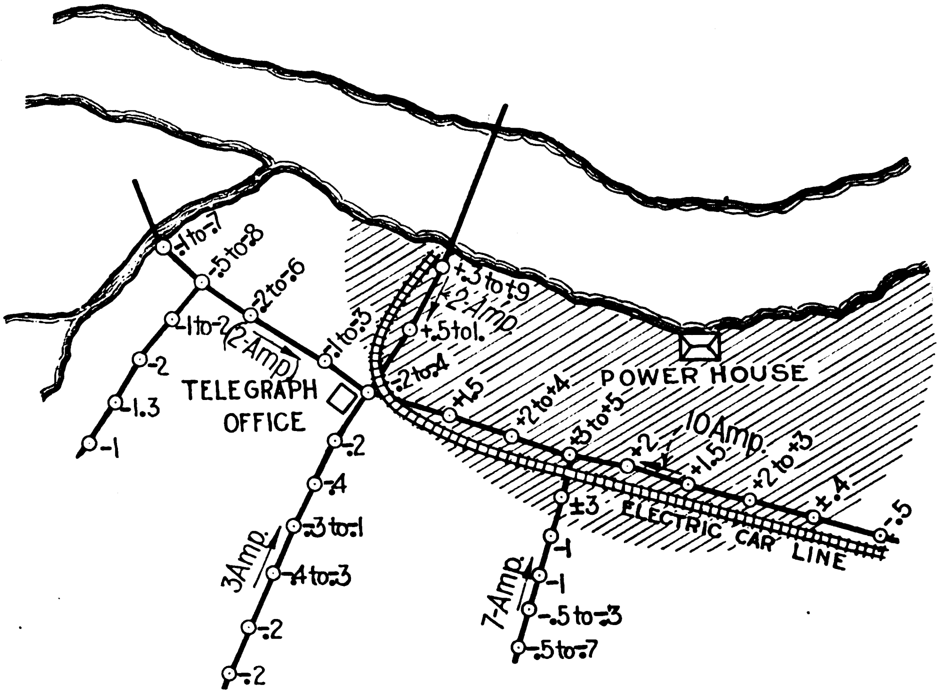

FIG. 8—SURVEY OF CABLE SHOWING DANGER AREA.

Test data can be best recorded and preserved by providing suitable arranged standard forms—both for field use and for summarizing. Maps are the best means for recording data regarding the railway, cable and pipe systems and their physical relation to each other. It is also desirable to provide maps on which the results of tests can be recorded. (See Figs. 8 and 9.) Such records greatly facilitate the study of data and the comparing of conditions during different series of tests.

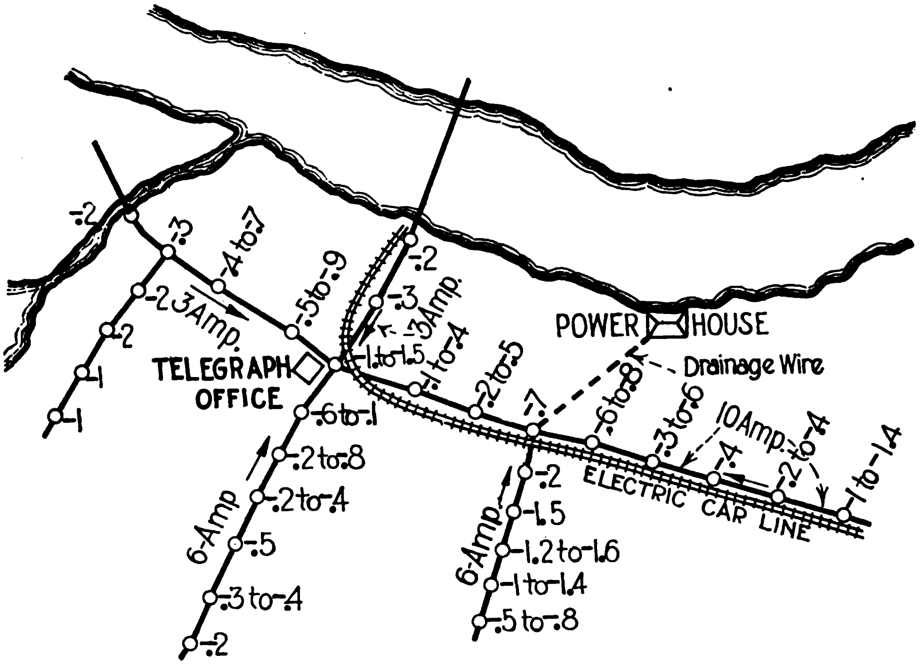

FIG. 9—SURVEY OF CABLE AFTER INSTALLATION OF DRAINAGE WIRE.

The best method of recording tests made for determining the correlation between different conditions is to plot the test results on cross-section paper. For example, Fig. 10 shows two curves that are so similar in form that there is little doubt that the current in the cable sheath is caused by the power station in question.

SURVEYS DURING THE INSTALLATION OF NEW CABLE.—When a cable is to be installed in a conduit where no cable previously existed, it is desirable to anticipate the possibilities of electrolytic corrosion and to collect all available data regarding the neighboring electric railway and underground systems. If the danger of corrosion seems very probable it may be even worth while in special cases, to make preliminary readings of track drop on the railway system.

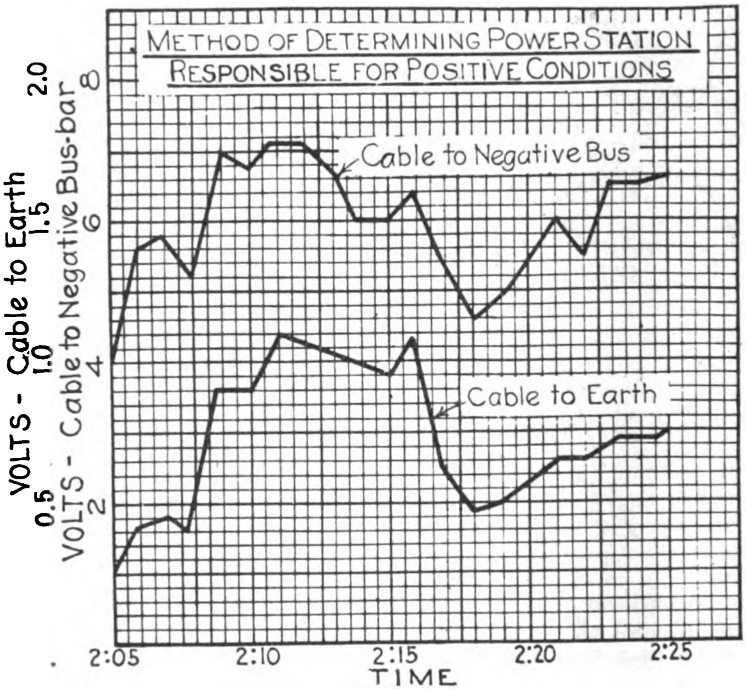

FIG. 10—CURVES SHOWING METHOD OF RECORDING TEST DATA.

As soon, however, as any considerable length of cable has been installed a preliminary survey should be started. Care should be taken, however, that the cable sheath is electrically continuous before the tests are made as otherwise the test conditions will not conform with the conditions that will exist later. If the cable splicing is not undertaken and pushed along as soon as the cable is pulled into the ducts, adjacent lengths should be temporarily bonded together by means of copper wire (not smaller than No. 9 B. & S. gauge) soldered to the sheaths.

When a new cable must occupy iron pipes, either underground or on buildings, the person responsible for electrolysis maintenance should make sure that the pipes are kept free from contact with bridges or other metallic structures and that proper separation is provided between the pipes and other metallic structures laid in the earth, such as rails, water and gas pipes, etc. In any manholes which may happen to contain other cables, the different cables should usually be bonded together, but the cable should be kept clear of everything else in the manhole except the cable hooks by which it is supported.

AERIAL CABLES.—Metal-sheath aerial cables are not as liable to corrosion from electrolysis as underground cables, but there are usually sufficiently good conducting paths to ground to make electrolysis a possibility. Hence such cables should be occasionally surveyed for electrolysis, and protective measures provided when found necessary.

Where aerial cables connect to underground cables, especially to short lengths such as at underground crossings of railroads, it is desirable to break the continuity of the sheath if practicable, either by insulating joints or otherwise. When this cannot be done, the entire cable, both aerial and underground, should be subjected to the same electrolysis supervision as if it were all underground.

(To be continued)

Census Report on Electrical Apparatus and Supplies.

The Census Bureau, at Washington, D. C., has issued a report on the manufacture of electrical machinery, apparatus and supplies for the calendar year 1914. The report shows that New York was the leading state in the industry, and that the value of electrical machinery, apparatus and supplies produced in that state was nearly $74,000,000, or more than one-fifth of the total for the United States.

The total value of telegraph instruments and apparatus produced in 1914 was $2,248,375. This sum is divided as follows: Police, fire, district and miscellaneous, $1,253,954; wireless apparatus, $672,575; intelligence (telegraph), $201,956; switchboards and telegraph parts and supplies, $119,890. The total value of telephone apparatus was $22,815,640, an increase of 60 per cent. over that reported for 1909.

Mr. W. M. Steuart is chief statistician for manufactures, under whose supervision this report was made.

Camps Morse and Vail.—Camp S. F. B. Morse has been established at De Leon Springs, Fla., and Camp Alfred Vail at Little Silver, N. J., near Long Branch. This is a fitting testimony to the importance of the telegraph in the conduct of the war.

The Telegraph and Telephone Life Insurance Association has levied assessments 628 and 629 to meet the claims arising from the deaths of J. A. Scott at Muskogee, Okla.; H. C. Doughty, Cape May, N. J.; J. H. Kane, Detroit, Mich.; W. J. Logan, Garfield, Kan.; F. Merrihew, Haines Falls, N. Y.; A. E. Hoyt, Halifax, N. S.; H. S. Burchell, Brooklyn, N. Y.; A. W. Wright, Rockland, Mass.

The Serial Building Loan and Savings Institution, New York, will accept partial payment subscriptions to the second Liberty Loan from its members, payments to be completed within one year from date of subscription.

Report New York Telegrapher's Aid Society.

The statement of the New York Telegraphers' Aid Society for the quarter ended September 6 is as follows:

Balance on hand June 6		$25,277.29
Receipts		1,225.95
Total		$26,503.24
Disbursements:		
Death Benefits	$100.00	
Sick Benefits	760.00	
Expenses	238.75	
		$1,098.75
Balance on hand September 6		25,404.49
Total		$26,503.24
RELIEF FUND.		
Balance on hand June 6		$6,282.03
Receipts		252.54
Total		$6,534.57
Disbursements		$18.00
Balance on hand September 6		6,516.57
Total		$6,534.57

New York Telegraphers Aid Society.

The annual entertainment of the New York Telegraphers Aid Society will take place at the Lexington Avenue Opera House and Terrace Garden, Fifty-eighth Street and Third Avenue, New York, on the evening of November 13. The programme consists of high class vaudeville entertainment, followed by dancing. The entertainment is for the benefit of the charity fund, which is an auxiliary fund, maintained by the net proceeds of these entertainments, and is used for the immediate relief of worthy telegraphers who may be in distress, and who, because of infirmity, are ineligible for membership in the society.

Mr. C. A. Kilfoyle, Box 711, New York City, is the financial secretary of the society. All communications regarding tickets should be addressed to him.

LIEUT. F. M. McCLINTIC.

Lieutenant F. M. McClintic, of the United States Signal Corps, is one of the best known expert telegraphers in the country. He is a prize winner at various tournaments and his telegraphic experience will be of great value to the United States Army Signal Service.

LETTERS FROM OUR AGENTS.

New York Western Union.

G. E. Palmer, chief operator, has returned to his desk after a vacation spent motoring in Massachusetts.

John A. Clark, of this office, has been temporarily transferred to Boston to take charge of the Commercial News Department plant equipment. Mr. Clark had been assisting A. V. Waldron in the Commercial News Department, New York, but is perhaps better known as the popular captain of the Commercial News Department baseball team, which made such a valiant fight this summer to win the trophy.

John D. McNally, formerly of the "Tube Centre," is now in the government signal service.

Louis Hammet, of the plant department, has enlisted in the regular army.

On or returned from vacations: W. R. Taylor, chief clerk to Chief Operator G. E. Palmer; W. A. Young, assistant to W. R. Taylor; Miss E. Wilson, of the city line department; F. S. O'Connor, senior supervisor of city lines, accompanied by his wife, who was formerly Miss Agnes Sheehan, of this office; John Morison, supervisor, western ways; and J. P. Clolery, supervisor, Jersey ways.

Martin Durivan, chief operator of the Long Branch, N. J., office, which has been closed for the season, has returned to this office and resumed his old position of supervisor in the Jersey division.

Bryan Grant, aged eighty-three years, an old-timer in the Commercial News Department, died October 16 at the home of his son, in Newark, N. J. He had been on the pension rolls for the past four years, and was an employe of the Commercial News Department for forty-seven years.

A. W. Wohlrabe, aged seventy years, an old-time operator who had charge of the typewriters in the branch offices, died October 13.

The names of the active bowlers on the team which represents the office of the vice-president in charge of traffic during the present season are, H. L. Randolph, F. A. Pirie, W. Law, C. W. Frey and A. M. Powers.

Philadelphia Postal.

Elmer R. Beidelman, an operator in the main office, died on October 13, after an illness of several months. He was forty-seven years of age and leaves a wife and one daughter.

Nathan Broker has been assigned to the Baltimore first bonus circuit.

According to the individual operators' record recently posted by Chief Operator Miller, sixty per cent. of the main office operators had perfect records for the past three months. Many of the number were not involved in errors since the beginning of the year.

Horace O. Steltz, of the main office, has the sympathy of his host of friends in the loss of his wife, who died on October 22 after a long illness.

A new motor truck was recently added to the equipment of Gang Foreman R. W. Treut. Its first trip was made between Philadelphia and Frederick, Md., a distance of 150 miles.

An additional emergency private power supply was recently installed in the main office, to safeguard against any interruption to telegraph service.

An additional printer system has been put in operation between Philadelphia and New York.

The telegraph training school that was started several months ago under the direction of Oliver C. Balmer now has thirty-eight students, all of whom are progressing.

Telegraphers who have been engaged in other fields are being attracted to the telegraph service to temporarily fill the places of those who have entered military service.

Philadelphia Western Union.

The main office at Fifteenth and Chestnut Streets is well represented in the American army.

Barney Kaiser—no relation to William Hohenzollern—and Ralph Parks, who enlisted shortly after war was declared, are in the Signal Corps in France.

Leo McKloskey, according to last reports, is located at the Statue of Liberty, New York harbor, in the radio service.

Joseph A. Bailey is with the National Army at Camp Meade, Admiral, Md., along with James McKeever, W. A. Brasure and Leo Confoy. All are infantrymen but McKeever, who is attached to the heavy artillery.

The boys and girls of the operating room contributed approximately $50 and purchased wrist watches for all four.

Harry Norton, who for many years has worked different leased wires in and about Philadelphia, and who enlisted in the Canadian army in 1915, returned home last month on a sick furlough. He is a veteran of Verdun and Vimy Ridge and is suffering from shrapnel wounds in his leg and hips and "shell shock" received when he went over the top at Vimy Ridge on an infantry charge. Mr. Norton, always quiet and retiring, tells of experiences that cause chills to run down one's back. His story of the advance of his regiment at Vimy Ridge rivals anything that has come out of the war. Mr. Norton hopes to return to the front when he recovers.

Benjamin Hall, who worked the Associated Press wire at the *Evening Telegraph* office, has enlisted in the radio service and is stationed at League Island Navy Yard.

Michael Bradley is also at League Island Navy Yard, in the wireless station. Mr. Bradley enlisted when war was declared last spring. Both Hall and Bradley have been promoted to chief electricians.

Manila, P. I.

There are now only a few American operators left in the service of the government in the Philippine Islands. All branches of the service have been Philippinized and the American operators who are left will probably return to the United States at a not far distant date. The Bureau of Posts was the last one to fill up with Filipinos, all of whom are apt scholars and adopt western ideas readily.

J. Weir, superintendent of telegraph; J. J. Roberts, chief operator, and Tom Bowers, cable tester and assistant chief operator, are the only telegraphers from the states remaining in the main office at Manila, the telegraph call of which is "MA." These gentlemen, who are well known in the States, have left their impress on the telegraph and cables in the Philippine Islands.

Rubber Telegraph Key Knobs.

No operator who has had to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fit snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. Price, fifteen cents. Address orders to TELEGAPH AND TELEPHONE AGE, J. B. Taltavall, Publisher, 253 Broadway, New York.

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Telephone Building, 24 Walker Street. Room 1129. Daily 9 a. m. to 2 p. m.
Saturdays 1 p. m.

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NEW YORK, NOVEMBER 16, 1917.

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Service Flags.

Some idea of the great strain placed upon the telegraph and telephone companies by reason of the drafts upon their operating forces for military service may be obtained from the service flags displayed by them. To simply say by word of mouth that a company has supplied 100 or 1,000 men for service at the front makes only a momentary impression, and then it is forgotten, but to announce the fact in a more concrete form, by some such symbolic expression as a service flag, a deeper impression is formed upon the mind.

The American Telephone and Telegraph Company and its associated companies have supplied 6,861 of their employes for the service, according to a flag hung at its headquarters, and the Western Union Telegraph Company's flag at 24 Walker Street shows that the operating staff has been depleted by 110 members from the New York office alone.

These figures are insignificant when compared with the strength of the entire army, but when they are considered separately from the mass, as having been abstracted bodily from two active and important industries, the effect of this shortage upon these utilities may be imagined.

An Abbreviated Convention.

Every year since its organization the Association of Railway Telegraph Superintendents has met in convention. This year, however, it has theoretically canceled its convention, but practically it has not. In place of the regular convention a special meeting has been called and will be held in Chicago on November 22, at which business of an important and general character will be transacted. Members will be present from the various parts of the country, and in all respects the meeting will be similar to the regular conventions, only it will not last so long, and there will be no entertainment features. The change is merely one of phraseology, rather than of character. But a rose would smell as sweet if it were called by any other name, and for a similar reason a gathering of individuals to exchange ideas and discuss problems is none the less a convention, although it may be called a special meeting.

However, this need not disturb the minds of the superintendents who attend, for they will have enough business of greater importance to keep them busy during the short meeting.

The Death of Jeff W. Hayes.

The announcement of the death of Jeff W. Hayes in Chicago on November 2 will be received with deep regret by his very large number of friends and acquaintances throughout the country. He was known more widely than probably any other telegrapher was known because he visited all sections personally, and under circumstances that, to most men, would have been impossible and disheartening, to say the least.

Laboring under a great physical disability, he bore up with a cheerfulness and resignation that brought men in possession of all their faculties to realize how much they had to be thankful for. Yet, despite this great drawback, Mr. Hayes traveled about the country alone and accomplished as much work as if his eyes were not sightless.

Mr. Hayes, as all our readers know, obtained his living by writing telegraphic sketches for publication, and he had a very entertaining style of presenting his stories. They related chiefly to the early days of the telegraph in the West, when that region was in that period of its existence known as "wild." Those days have gone, but Mr. Hayes did his part to preserve their history for the entertainment of future generations.

The cause of Mr. Hayes' death was Bright's disease of the kidneys. He underwent a surgical operation in Portland, Ore., during the past summer, and it is supposed that the consequent shock developed the disease which caused his death. As the disease progressed he lapsed into coma and his life gradually faded away.

Stock Quotations

Following are the New York closing quotations of telegraph and telephone stocks on November 14:

American Tel. and Tel. Co.	108
Mackay Companies	71-74
Mackay Companies, pfd.	58-61
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2⅞
Western Union	83½

An Opportunity for Investment.

The present low prices of stocks offer extraordinary opportunities for investment. This publication is prepared to purchase for its friends one or more shares of Western Union, Mackay, Marconi or any other stocks, either outright or on the instalment plan. Remit $25.00 per share as the initial payment if purchase is to be made on the instalment plan. The stock will then be purchased at the market price and the balance due on the stock can be paid off in any sum convenient to the purchaser. In the meantime 6 per cent interest will be charged for the balance due on the stock. The purchaser, however, will have the benefit of the dividends, which, in many cases, will more than pay the interest charges. As soon as the stock is paid for it will be registered in the purchaser's name and delivered to him. The commission charge on the purchase of stock is $1.00 on transactions covering from one to eight shares. For eight or more shares the commission charge is 12½cents per share. In remitting to cover purchases of stock, name the price at which purchases are to be made.

Telegraph and Telephone Patents.

ISSUED OCTOBER 16.

1,243,048. Thermic Telephone. To P. de Lange and R. A. van Lynden, Utrecht, Netherlands.

1,243,314. Telephone Metering System. To A. E. Lundell, New York.

ISSUED OCTOBER 23.

1,243,721. Measured Service Telephone System. To J. Erickson, Chicago, Ill.

1,243,747. Telephone Trunking System. To F. Libberger, Chicago, Ill.

1,243,749. Measured Service Telephone System. To T. G. Martin, Chicago, Ill.

1,243,755. Telephone. To F. C. C. V. Naeser-and and N. A. J. Lilliendahl-Petersen, Copenhagen, Denmark.

1,243,761. Automatic Telephone System. To F. R. Quayle, Chicago, Ill.

1,243,789. Valve Receiver for Wireless Signals. To G. M. Wright, New York.

1,243,922. Cordless Telephone Switchboard. To M. L. Currier, Cottleville, Mo.

1,244,081. Time-calling Device for Telephones. To E. Rogers, Chicago, Ill.

1,244,433. Telephone Mouthpiece. To G. Dorsky, Seattle, Wash.

(Reissue) 14,380. System for the Transmission of Intelligence. To E. H. Colpitts, New York.

PERSONAL.

Mr. J. Will Kelley, secretary of the Chamber of Commerce, Topeka, Kan., has resigned his position with that organization to accept the appointment of director of finances of the Piersen Telegraph Transmitter Company, of that city.

Mr. A. J. Eaves, assistant electrical engineer, Postal Telegraph-Cable Company, New York, has resigned after fifteen years service and joined the engineering staff of the Telegraph Development Department of the Western Electric Company, with headquarters at New York.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

Mr. C. C. Adams, vice-president, New York, has been appointed fuel administrator for the south shore of Nassau County, N. Y., under Doctor Garfield, United States food and fuel administrator, to provide adequate and equitable distribution of coal by dealers at prices fixed by the President.

General Superintendent A. B. Richards, of the Pacific Division, San Francisco, accompanied by Superintendent J. A. Forehand, of Seattle, is visiting offices in the second district.

Mr. C. D. Miller, former manager of the El Paso, Tex., office of this company, who is now a lieutenant in the Signal Corps, was an executive office visitor November 12, while on his way to France.

Mr. H. F. Melville has been appointed chief clerk to Superintendent E. Kimmey, at Boston, Mass. Mr. Melville was formerly chief bookkeeper at Boston.

Mr. C. S. Rindfleisch, of the Cleveland office of this company, accompanied by his wife, will leave in a few days for Fort Myers, Fla., to look after phosphate-lime and other investments in which he is interested.

Managers Appointed.—William F. Thoeny, at Chillicothe, Ohio; B. D. Edwards, Massillon, Ohio; M. C. Clarke, Maysville, Ky.; J. P. Creighton, La Salle, Ill.; W. H. Blechinger, Tiffin, Ohio; Merrit Hilton, Long Beach, Cal.; J. Greenawalt, San Diego, Cal.; Loraine B. Allen, Riverside, Cal.; F. L. Pachel, San Bernardino, Cal.; L. E. Dover, Fort Valley, Ga.; Miss Pearl O'Neal, Hot Springs, Ark., and T. Holmes, Troy, N. Y.

Line Construction.—This company is making good headway on its new pole line between Salt Lake City, Utah, and Spokane, Wash., via Butte, Mont. Mr. Charles M. Baker, general superintendent of plant of the Western Division, Chicago, is now in Salt Lake supervising the work between Salt Lake and Butte, and Mr. J. J. Lynch, superintendent of construction of the Pacific Division, San Francisco, is in charge of the mountain work from Butte westward.

New Memphis Office.

This company recently moved into new offices at the corner of South Court Avenue and Maiden Lane, Memphis, Tenn., which location is in the heart of the city. Every modern convenience has been provided for the staff, and the equipment is modern throughout. The operating department is connected with the business office by double pneumatic tubes.

The new quarters were designed and installed by Mr. John F. Heard, division electrical engineer of the Southern Division, Atlanta, Ga. He also superintended the work of removing from the old office to the new.

The Memphis office is in charge of Manager C. H. Johnson. The operating department is presided over by W. F. Pope, chief operator, assisted by H. S. Simpkins, wire chief; J. T. Jenkins, repeater chief; L. H. Yancey, traffic chief; Frank Ross, night chief; W. A. McKeever, all-night chief, and G. A. Bishoff, assistant chief.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

RETURN OF OFFICIALS FROM THE PACIFIC COAST.—Messrs. Newcomb Carlton, president, and party, consisting of Lewis McKisick, assistant to the president, and Vice-Presidents John C. Willever and W. N. Fashbaugh, returned on November 5 from a trip of inspection to the Pacific Coast. They left New York on October 13 and visited the principal cities along the coast.

MR. B. F. MCCARTHY, of the office of the vice-president in charge of traffic, has been transferred to the Western Division office.

MR. O. L. TURNER, of Kansas City, Mo., has accepted a position in the office of Mr. I. N. Miller, Jr., district commercial superintendent, Seattle, Wash.

MR. C. E. MILLER, of the Columbus, Ohio, office of this company, was married to Miss Vertie Kious on September 29.

THE CABLE.

MR. G. G. WARD.—For the past three years Mr. George Gray Ward, the vice-president and general manager of the Commercial Cable Company, has been absent from Europe. Before the present war he visited the European end of the cable system annually, and his face was as familiar in London and elsewhere as in New York. It will be pleasing news to his many friends to know he is enjoying the best of health and is active in the management of his company of which he is the dean.—*Zodiac*, London.

M. L. DELAFIELD, aged eighty-one years, one of the original directors of the International Ocean Telegraph Company, died at his home at Riverdale-on-the-Hudson, November 5. The cable of this company connected Punta Rassa with Key West, Fla., and Havana, Cuba, and was completed in 1866. Mr. Delafield at one time was secretary of the company. He retired from active business many years ago.

REDUCTION OF CABLE RATES.—The Mexican Telegraph Company and the Central and South American Telegraph Company, operating jointly the All-American Cables, has announced a reduction in cable rates between North America and Central and South America, to take effect on December 1. The rate on traffic between the United States and Colombia, Ecuador, Peru, Bolivia, Chile, Argentina, Uruguay and Paraguay, will be reduced fifteen cents, making the rate between New York and these countries fifty cents a word. Deferred rates will be reduced proportionally. The rate between the United States and Panama will be reduced 10 cents a word, making the rate 30 cents, and the rate between the United States and the Central American Republics will be reduced six cents, making the rate between Galveston and those republics thirty-five cents.

EXTENSION OF SOUTH AMERICAN CABLE SYSTEM.—The Central and South American Telegraph Company received a message from its agent at Rio de Janeiro, dated November 5, to the effect that the Brazilian government has finally signed the contract for the extension of its all-American cables via Colon to Brazil, by cable from Buenos Aires to Santos and another cable from Buenos Aires to Rio de Janeiro. These extensions will be promptly carried out as soon as war conditions will permit.

Cable Codes.

The office of TELEGRAPH AND TELEPHONE AGE is headquarters for all cable cipher codes. Telegraph managers would do well to bear this fact in mind when customers make inquiries regarding such codes. We are prepared to furnish full information on the subject, our knowledge being based on thirty-five years' experience in handling the hundreds of codes on the market.

Western Union Cable to Germany.

In his book on "The First Days of the Great War," Hon. James W. Gerard, ex-Ambassador of the United States to Germany, says:

"Before the war there was but one cable direct from Germany to America. This cable was owned by a German company, and reached America via the Azores Islands. I endeavored to obtain permission for the Western Union Company to land a cable in Germany, but the opposition of the German company, which did not desire to have its monopoly interfered with, caused the applications of the Western Union to be definitely pigeonholed.

"After the outbreak of the war, in August, 1914, when I told this to Ballin, of the Hamburg-American Line, and Von Gwinner, head of the Deutsche Bank, and when they thought of how much they could have saved for themselves and Germany and their companies if there had been an American owned cable landing in Germany, their anger at the delay on the part of official Germany knew no bounds. Within a very short time I received an answer from the Foreign Office granting the application of the Western Union Company, providing the cable went direct to America. This concession, however, came too late, and, naturally, the Western Union did not take up the matter during the war."

[There were two cables from America to Germany direct before the war, not one, as Mr. Gerard says. Both belonged to the German Atlantic Cable Company. The proposed Western Union cable between Germany and America would have been over 4,000 miles in length, and could not have been operated commercially by any known means.—Editor.]

CANADIAN NOTES.

WINNIPEG TELEGRAPHERS AT THE WAR. — The city of Winnipeg, Manitoba, has issued a sheet containing the portraits of sixty-one Winnipeg telegraphers who have entered war service. They are a fine looking lot of men, and intelligence is strongly marked on their features.

THE TELEPHONE.

FIRST LIEUTENANT JOHN J. DOLAN, who was, prior to enlistment, toll wire chief of the New England Telephone and Telegraph Company, Boston, Mass., was married to Miss Lillian R. Dooley, of Malden, Mass., a former toll operator for the same company in Boston, on November 14.

Large Service Flag.

A large service flag has been hung across Broadway from the Telephone and Telegraph Building, at 195 Broadway, by the American Telephone and Telegraph Company to commemorate the entrance into the government service of 6,861 of its employes. This number includes those identified with the parent company and its associated companies, but as that number of separate stars could not be placed on one flag the number is represented by the four numerals made up of stars.

Washington New York Underground Telephone Cable.

In the construction of the new underground telephone cable between New York and Washington by the American Telephone and Telegraph Company, which is now in progress, 2,126 reels of cable are to be pulled in, 176 vaults for line-loading pots are to be constructed, 223 loading pots set, 2,241 cable splices made at manholes and loading pots, and 893,234 individual wire splices made. The wire mileage involved is 84,754 miles of single wire.

The work will be completed to Philadelphia, northward, about November 15, then the stretch between Philadelphia and New York will be started.

In the two cables now in use between Philadelphia and New York there are 229 circuits, including phantoms.

Trustful Telephone Operator.

I had an odd experience on the telephone a day or two ago, writes a correspondent of the London *Daily News*. After I had rung up I suddenly found that I had not got the necessary three pennies. I wanted to telephone badly, and explained my position to the girl. "Never mind," she said, "ring me up tomorrow and pay then." I tried to express my admiration of her trustfulness and to assure her that it was not misplaced. "That's all right, dearie," she said suddenly; "I like your face."

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager, New York, has returned from a conference with the Navy Department at Washington. He was accompanied by Mr. David Sarnoff, commercial manager. Mr. Nally is now in Montreal in attendance on the directors' meeting of the Canadian Marconi Company.

Mr. W. A. Winterbottom, New York, has sailed for South America in the interests of the Marconi Company.

Mr. E. B. Pillsbury, general superintendent, and Mr. C. H. Taylor, engineer, have returned from an inspection of the high power stations in New Jersey and Massachusetts.

Mr. Frank Chapman, superintendent of the Southern Division, Baltimore, was a recent New York visitor.

Mr. Lee Lemon has been appointed production manager of the Marconi works at Aldene, N. J.

Radio Telephony in Japan.

The Institute of Radio Engineers held a meeting on Wednesday evening, November 7, in the Engineering Societies Building, New York, at which Mr. Eitaro Yokoyama, engineer of the Ministry of Communications, Tokyo, Japan, presented a paper on "Some Aspects of Radio Telephony in Japan." The paper contained an interesting summary of the little-known work which has been done in this field in Japan.

How to Conduct a Radio Club.

Radio clubs are constantly being organized throughout the country and in order to conduct their affairs properly some order of procedure should be observed. "How to Conduct a Radio Club," by Elmer E. Bucher, instructing engineer for the Marconi Wireless Telegraph Company of America, gives all of the parliamentary information on this subject. Besides, the book contains directions for indoor and outdoor experiments and much other information of a wireless character. It has 128 pages and 116 illustrations. It is an excellent book and costs only 50 cents per copy.

Send orders to TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

WHAT IS MATTER?—Matter is the general name which has been given to that substance which, under an infinite variety of forms, affects our senses. We apply the term "matter" to everything that occupies space, or that has length, breadth, and thickness. It is only through the agency of our five senses (hearing, seeing, smelling, tasting and feeling) that we are enabled to know that any matter exists. A person deprived of all sensation could not be conscious that he had any material existence.

Efficiency Engineering in the Telegraph Service.

(Continued from page 496, November 1)

The human mind is clearest in the morning and that is the best time for those who have correspondence to attend to to get rid of it. Judgment is at its maximum efficiency when the brain has had rest. It is well, therefore, to be at the office early to attend to correspondence and clear the desks of matters that need attention. Many, however, do not believe that this method of daily procedure is the best. They prefer to first read the letters, lay them aside, think over them for a few minutes, then attend to some duties of a routine character until noon. After dinner, questions that have arisen during the morning are brought to their attention and, with other matters of more or less importance that develop in the transaction of business, three or four o'clock arrives when, with a fagged brain, they turn to the correspondence that has accumulated. If anyone thinks it is an easy task to dispose of from ten to fifty letters as they should be attended to in the remaining time, let him try it. The facts are, the correspondence does not receive the attention it should. Short cut methods are resorted to to get off the accumulation. In fact, anything to reduce the labor is welcomed. The stenographer is piled up with work at the last hour in the day, which necessitates remaining one or two hours each evening to catch up.

A general superintendent once informed us that if he had the authority to insist upon it he would compel every employe who had correspondence to attend to to give it his attention the first thing each morning and not wait until 4 or 5 p.m., which necessitated keeping his force overtime to prevent a congestion.

Efficiency in the handling of each day's duties is just as important as efficiency on the part of the chief operator in assigning his force to the various circuits under his supervision. Many letters are of such a character that those who do the typing can attend to the answering, particularly those of a routine character, so that those in charge can be relieved of this portion of the correspondence.

Every member of the President's cabinet can be found at his desk in Washington at 9 a.m. until 3 p.m. Many of them before the first named hour have attended to the correspondence that needed their personal consideration. Method and efficiency reduce the day's work, no matter how burdensome it may be, to a labor of pleasure if one wishes to make it so. On the other hand it can be made burdensome from the moment the local official arrives at the office until he leaves it at night. His arrangement of the day's work before him can be adjusted so that it will be attended to without friction and ruffled tempers or it can be adjusted so that every minute of the time is productive of little troubles and annoyances that cause every employe to remark, when leaving off work, that "this has been a hard day for me." A manager should always remember that his office staff should never be kept one minute after the time to go home if it is possible to avoid it, and it is possible ninety-nine times out of a hundred. Do not enter the office at 3 or 4 p.m. as though you had just accomplished some great task and then start in to keep everyone on the jump for the following three hours. You might fool the employes some of the time but you cannot do it all of the time. They know that you have wasted many hours on the outside, and you are getting even with your force on the inside. When it is time for them to go home they look back to the several hours that have been wasted, when it was the duty of those in charge to have kept them busy. A horse can easily draw a wagon containing one ton of stone a distance of one mile twelve times a day. You cannot cut out four loads in the middle of the day and expect the horse late in the afternoon to draw two or three tons as a load to catch up. The law is the same as applied to human beings. Do not waste the morning or the early afternoon hours and then expect to catch up on the delayed work between the hours of 4 and 6 p.m. It may work some of the time but it will not work all of the time, and the sooner these facts are acknowledged the better it will be for every individual concerned, and the service at large.

The employes have rights that the employer must respect, and we know, and most of our readers know, that a proper disposition of the day's work can be made so that everyone in the service will leave his office in a condition to enjoy his night meal and a few hours of recreation before retiring.

If there are any employers guilty of any of the inconsistencies mentioned in this chapter, let them try the remedy and note the difference in the improved conditions under which all work is accomplished. A return to the old methods will never again be sanctioned.

Never attend to matters in the afternoon that can be completed and finished in the morning. Insist upon the bulk of the day's work being completed by 3 p.m. and everyone will be happy and the business of the company will have received an advance in efficiency that will attract widespread attention in the shape of services well rendered.

(To be continued)

A Useful Book.

Telegraph and telephone people do not want to live in a telegraph or telephone atmosphere all the time, nor is it good for them to do so. There is just as much recreation for the mind in variety of reading as there is for the body in football and other physical games.

"Stephenson's Practical Test" is the name of a handy little book, but its name is far-fetched. It consists primarily of test questions for steam engineers, but contains a great deal of other useful and general information.

One of the questions the book contains is: "How can brass and other polished articles be kept from tarnishing?"

The answer is: "They can be covered with a thin coat of shellac dissolved in alcohol. The bright work should be warm before applying the coating, so it will flow smoothly and dry quickly."

There is a chapter on the dynamo.

The price of this book is $1.00 per copy. For sale by TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

Telephone Switchboards: Old and New.

Men's time these days is so crowded with the affairs of everyday life that they rarely have time to reflect upon what has been done in the past to bring the world up to the present high state of activity and development.

The telephone probably furnishes the most impressive object-lesson in development in the comparatively few years of its life, but the switchboard has undergone the most remarkable metamorphosis of all.

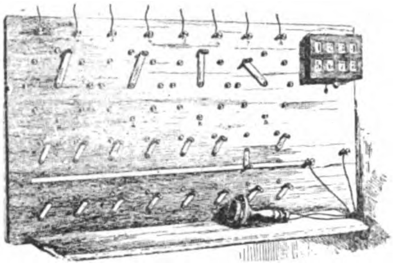


FIG. 1—FIRST COMMERCIAL SWITCHBOARD—1878.

The accompanying illustrations are interesting in that they bring the old and new types of central telephone exchange switchboard into strong contrast, and many people will be inclined to remark, "Is it possible that such changes could have taken place in telephone switchboard development within forty years?" But the world has been moving forward with rapid strides since Doctor Bell first brought his telephone to the attention of the skeptical world, in 1876.

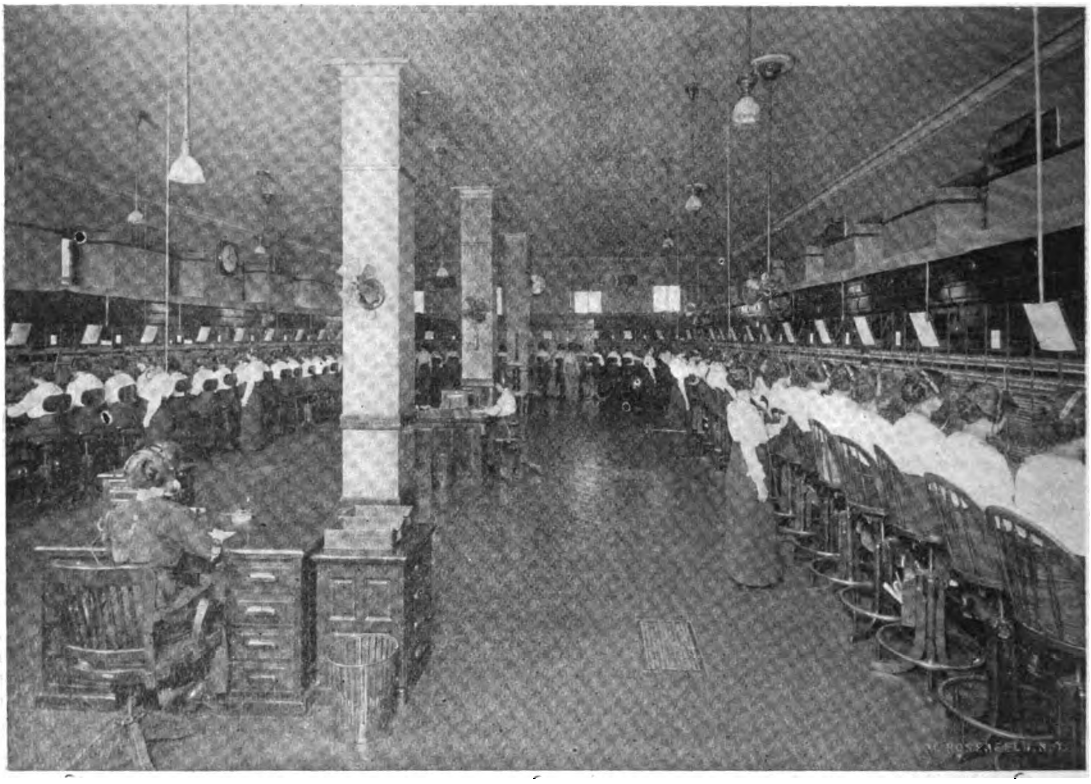


FIG. 3—MODERN TELEPHONE SWITCHBOARD IN NEW YORK.

Fig. 1 is a view of the first commercial switchboard, used in New Haven, Conn., in January, 1878. It had connections for eight subscribers, as shown by the call box on the upper right hand corner. The names of these eight subscribers ought to be engraved on the rolls of fame for their faith in the telephone promise.

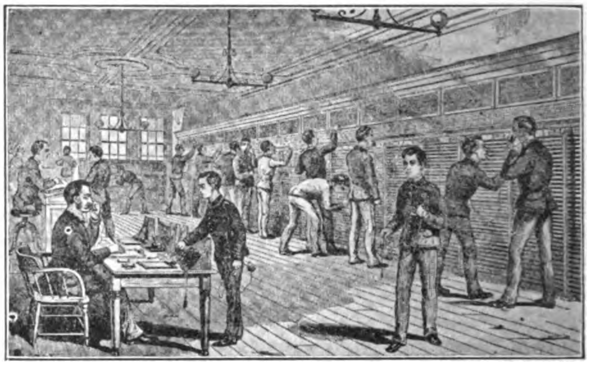


FIG. 2—INTERIOR OF NEW YORK EXCHANGE IN 1880.

Fig. 2 shows a view of the interior of a central telephone exchange in New York City, in 1880. The switchboard shown was of the plug and strip type and patterned after the old style telegraph switchboard.

Fig. 3 reveals the modern telephone switchboard in the "Spring" station on West Houston Street, New York. The contrast between the first and one of the latest exchanges in New York is very great and indicates, as far as pictures can indicate, the hold the telephone now has upon the people—both socially and commercially.

Wireless Signaling from Military Airplanes.

The following interesting account of the use of wireless signaling from military airplanes is taken from *The Wireless Age*. The importance of wireless in military operations was tersely expressed by one of the most prominent military aeronautical engineers in the country when he stated that "the day is just around the corner when all aviators must be wireless operators, as well." The present method of spotting artillery fire from airplanes is the subject of the article.

The observer in aircraft at the fighting fronts must have aside from his knowledge of wireless some grasp of the fundamentals of artillery fire. He must know, for example, the trajectory of shells, or the arc they describe, and be able to distinguish between the use of field guns for barrage fire and howitzers for destruction of heavy guns. This knowledge is required because in locating his piece's objective he may have to fly low, and, after reporting the enemy location, ascend to a safe height above the trajectory of the shell fire which he thereafter directs.

The usual height of an observer's flight is 4,000 to 6,000 feet; flying in circles and figure 8s, he sends by wireless a report of the effect of each shot and directions for greater accuracy. A word or two, such as "right," "left," "too short," and so on, is the extent of the direction given, and so skilled are gunners and observers nowadays that it seldom takes more than three or four shots to score a hit on the enemy battery emplacement.

At night the positions are revealed by the lights required by the gunners and by the flash of the gun. While special knowledge is required for night flying, fire spotting in the inky darkness is really safer for the aviator, because of the consequent ineffectiveness of enemy anti-craft guns.

The wonderful accuracy with which a target is located is mainly due to the carefully prepared maps given to observers. These maps are divided into squares representing 1,000 yards a side and numbered. Subdivisions of these squares into four parts are assumed, and given the letters a, b, c, d. Thus the first report of a location might be "4c," the principle being then extended by further subdivisions of the sides of squares into 100 parts, the calculations being based upon the southwest corner as the point of origin, the first figure giving the distance east along the southern side and the second figure the distance north along the western side. Thus a corrected signal, "2732," would locate the enemy battery twenty-seven parts east and thirty-two parts north of the southwest corner of the map's square previously signaled. When it is realized that such an observation, accurately made, gives the location within ten feet, the airplane wireless man's great importance in war is evident.

The method of communicating with the airplane observer is one of great interest. While it is reported that great strides in improvement of receiving sets have been made, the problem of overcoming the noise of the machine and similar difficulties has meanwhile led to the adoption of visual means of transmitting directions to airmen. This is accomplished by white strips of cloth six feet long by one foot wide, laid on the ground to form letters and symbols. These are easily visible from a height of 3,000 feet.

Assuming that the observer is serving three batteries and has been given the general direction and the nature of the enemy emplacement before rising, he will watch for specific directions as he ascends to the required height in safety behind his own batteries. The strips are then seen formed in the shape of the letter Z, which may mean "observe for time shrapnel," or perhaps a P, meaning, "observe for high percussion," or LYD, for high explosives. Later, at his post of observation he may note any of these symbols prefixed by an X, meaning "change to," or maybe two strips in parallel, which tells him, "am not receiving your signals."

Both methods and codes change continuously, but the basic principles are as just outlined, from which it can be seen that the mastery of manipulation of the wireless and the air machine itself are the principal difficulties in preparing a military aviator for service.

In this new field lie wonderful opportunities for wireless men. They have scarcely been realized, but this much is definitely known. The skilled wireless operator receives preference in military aviation service.

Science and Industry.

Sir Isaac Newton, shortly before his death, said: "I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me"—yet Leibnitz estimated that Newton had achieved far more than all other mathematicians put together from the beginning of history. Lord Kelvin, at his jubilee, in reply to the homage of the whole scientific world, said: "One word characterizes the most strenuous of the efforts for the advancement of science that I have made perseveringly during fifty-five years; that word is failure." Yet he towered above all his scientific contemporaries, and was perhaps the greatest savant that the world has known. It is, in fact, a trait common to all who have spent their lives in the pursuit of knowledge, and have acquired a profound acquaintance with the hidden mysteries of nature and science, that they, more than all others, realize the immensity of the field that lies open before them—shrouded in mists, it is true, and beset with pitfalls, *culs de sac*, false clues, but also holding treasure in store of inconceivable richness for the reward of those who patiently grope amid its gloomy fastnesses. We have as yet but ventured over the border of that illimitable expanse; the further we penetrate into its depths the better we appreciate the wealth that lies beyond, and the greater becomes our strength to overcome the difficulties that confront us. We see, too, how far we have strayed from the true path in the complacent past when we thought we had approached finality in one or another quest.—London *Electrical Review*.

How Did the Steel Magnet Get Such a Pull?

It is not an easy task to tell in story form, especially an amusing story, profound scientific facts, but success has attended the effort to do this on the part of "S. A. Menutt," in the *Western Electric News* for September. Although the article is written in a humorous vein, the scientific facts coming to the surface now and then become a pleasure to study, and they are stated in such plain language as to make them easy to grasp.

The illustrations accompanying the description are as unique as the language used, and are reproduced herewith in connection with selected portions of the article.

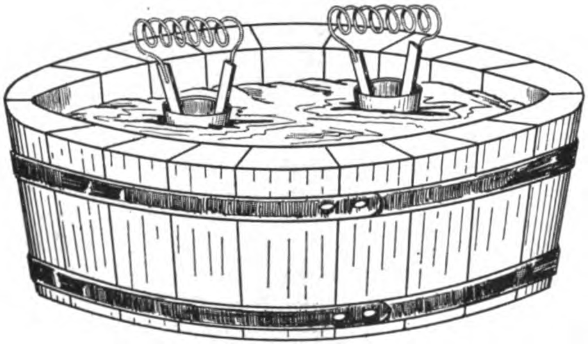


FIG. 1

"Well, of course, Menutt, we know certain laws governing magnetic action; if we didn't we would not be able to build ringers, receivers, retardation coils, and so forth, but if you want to know how a magnet is a magnet, I give it up—nobody knows that I know of."

"I suppose you understand that we don't know any more about what electricity is than we do about magnets. That is, we know that the electric current will heat a wire red hot, and will give an awful bump when applied to the human body, but as to the exact 'how' and 'why' of it, why we are still guessing. We know, however, that something is going on in the space alongside of the wire, and if we bend a wire carrying current into a circle many curious things go on within this hoop.

"If you put enough of these hoops side by side and connect the beginning of one to the end of the next—thus forming a coil—you can, with enough current and a sufficient number of circles or turns, lift a ton of iron and hold it suspended in the air. That's the way we unload pig iron from the railroad cars out at Hawthorne. If you stepped inside of this coil, and every bone and muscle in your body became paralyzed, it would not be surprising, because it is easy to imagine that any power which would lift a ton of iron could readily put a human being out of business, but—and here is the mysterious part of it—nothing happens at all. People have put their heads in the space between the poles of enormously powerful magnets and experienced no sensation whatever.

"The question is, What is going on in this space which will hold almost any weight of iron and yet has no effect upon human sensations? We don't know, but we think that it may be similar circles in the iron. Many years ago it was noted that coils (which are nothing but a number of hoops placed side by side and connected together), carrying current, attracted each other, and the following experiment to demonstrate this has been tried by innumerable investigators."

Mr. Ashpit here drew a sketch (Fig 1) on the pad, showing two batteries floating in a tub, the zinc and carbon of each connected by a coil.

"Now, no matter what position you put these little coils, they will always float back into the same position with reference to each other; that is, they will always come together end to end, and the same ends will always be adjacent. If, however, you should bend the spiral around as in Fig. 2, so that the various individual circles face in all directions, then no movement of the floating battery would occur. This shows that when the circles face in various directions they neutralize each other; whereas, when arranged in a straight and orderly manner, one in front of the other, their forces are added to each other.

"For many years scientific men have thought that if electric currents traveling around in circles were present in iron it would account for the peculiar magnetic properties of this metal, but the difficulty lay in explaining the source of any such currents, and why they should travel in a circle. Now, however, that the existence of electrons in the atom is practically proven, the problem becomes somewhat more imaginable.

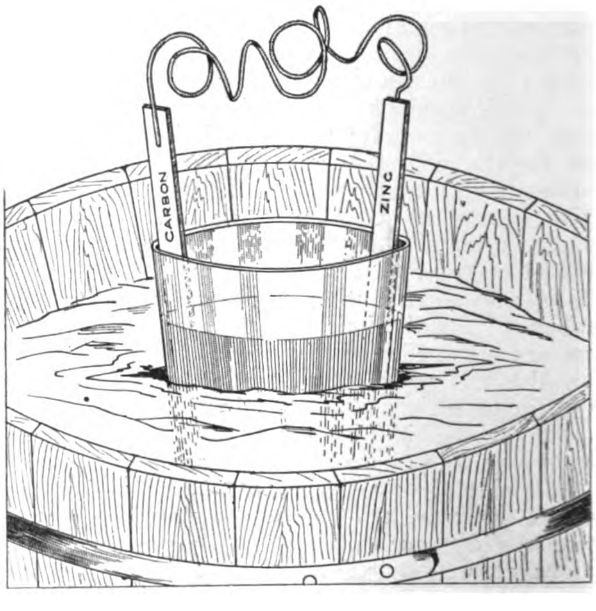


FIG. 2

"Extremely sensitive measurements show that every substance is to some slight degree affected by the magnetic field, but iron, nickel and cobalt are unique in their response to such stimulation, and one logical way of accounting for it would be to say that, while all demons could juggle some, the iron demons are some jugglers. That is, they can keep a much greater number of balls traveling in circles, and at a much higher speed, than the demons in any other substance. Iron shows none of these properties, however, until placed under the influence of a magnetic field. In other words, the atoms are facing every which way and the various circles neutralize each other, just the same as in Fig. 2. The general idea is illustrated in Fig. 3; the atoms are all busy juggling the balls, but their work is wasted for lack of direction. When, however, the demons are subjected to an external magnetic force they all line up as a battalion of soldiers, as shown in Fig. 4. You see here that you have the large coil carrying current and also the great number of atomic circles of current, and by the experiment of the little batteries in a tub of water you know that electricity traveling in a circle creates a condition within the circle known as a magnetic field, and that two such circles will attract each other; so the piece of iron represented by the regiment of demons is immediately drawn into the coil in the background of the picture."

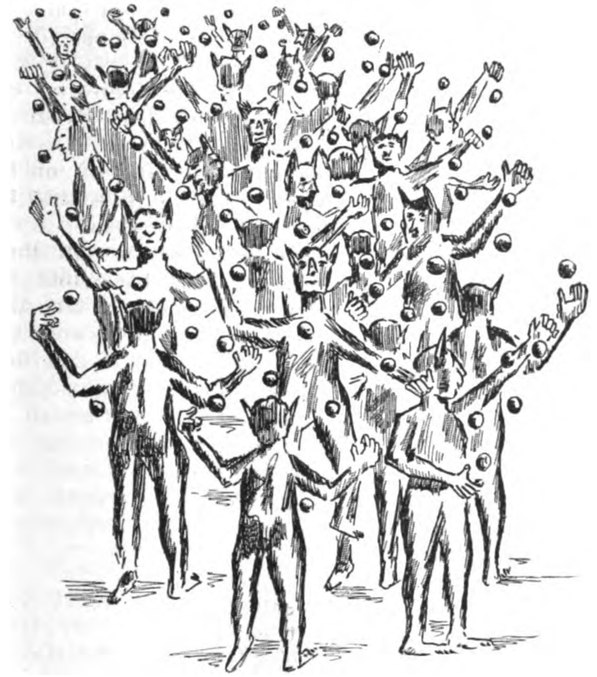


FIG. 3

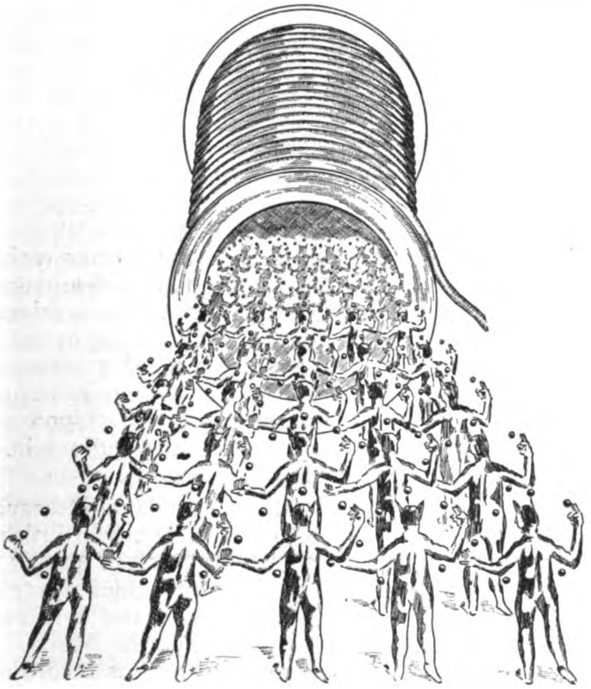


FIG. 4

"Oh, one thing more. This magnet I have has no coil around it, yet it draws a piece of iron. How is that?"

"Well, you see, Menutt, that magnet is made of steel. Now when you mix carbon in certain proportions with iron you form a substance known as steel, which has certain properties quite different from iron. For example, the carbon seems to paralyze the demons from the waist down under certain treatment.

"If you heat a piece of steel red hot and plunge it in water, it becomes hard, which is only another way of saying that you cannot push the atoms around mechanically. This same treatment holds the atoms in whatever position they may be placed.

"Your little horseshoe is a piece of steel hardened and then magnetized by a very powerful electromagnet like the one in the receiver assembly department. While this electromagnet can pull all the demons around into line, the demons themselves, on account of the hardened condition of the steel, have no power to break ranks."

Mr. W. J. Lloyd, formerly general manager of the Western Union Telegraph Company at Denver, Col., now living in retirement at Bayou La Batre, Ala., in renewing his subscription for another year (in fact, Mr. Lloyd has been a subscriber since this paper was established in 1883) has this to say: "I am wondering if you remember the old days in the 80's, and if any of us realize the many and really great changes in the telegraph, both in the corporate and individual sense.

"There are but few left of our old colaborers, and, as I look back, I think of Billy Wallace, Jimmy Largay, Jack Wolfinden, Gib Merrill, Jack McRobie, Harry Whalen and 'Bif' Cook, and I could fill pages, but what is the use? We soon must follow, and mayhap someone will be reminiscing on us.

"I heartily and sincerely congratulate you on your general good health, your splendid pluck against great odds and, finally on your really great success—the TELEGRAPH AND TELEPHONE AGE—a fitting monument to an early struggle and a final triumph, for I well remember the coming and passing of other efforts to establish a real telegraphic journal.

"May God prosper you ever and always."

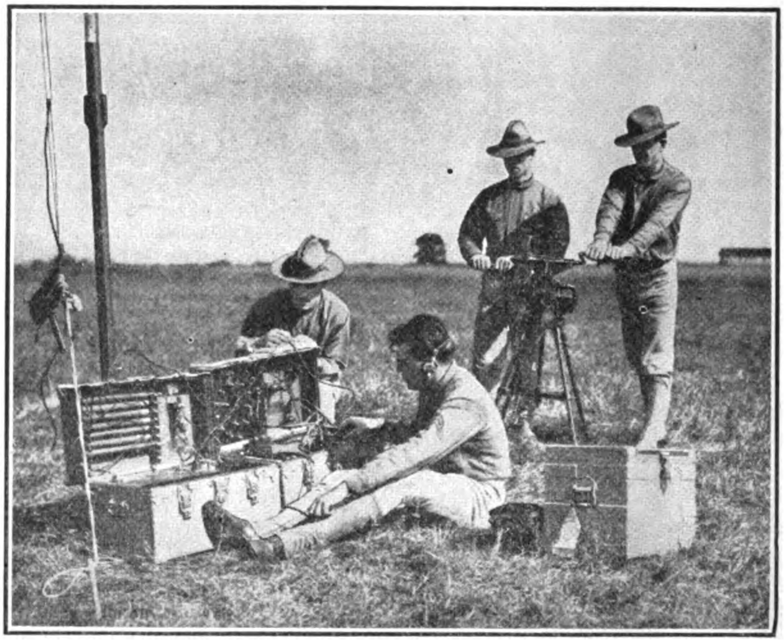
(J. B. Taltavall was an operator in Mr. Lloyd's division in the Chicago Western Union office in 1880 or 1881.)

Subscribe for TELEGRAPH AND TELEPHONE AGE and be up to date in knowledge and information. Price $2.00 per year.

Field Wireless.

In the Civil War the Morse telegraph was for the first time employed to direct widely separated armies to move them in unison, and it has ever since been one of the most important arms of the military service in all civilized countries. The telephone, in later years, has come upon the stage and now shares the honors with the telegraph, and without both it is safe to say that it would be quite impossible to conduct modern warfare.

The latest form of communication equally important is the wireless telegraph. This newest method of signaling is employed with great success by all of the countries at war. It has the advantage over both the wire telegraph and telephone in that no wires are necessary to carry the signals between distant points.



PORTABLE FIELD WIRELESS IN OPERATION

The accompanying illustration from Leslie's Weekly shows a portable field wireless plant in operation. The power is supplied by a hand generating machine operated by two members of the Signal Corps, and the whole outfit can be moved very readily as occasion requires.

Training Wireless Operators for the Navy.

The United States Navy is training radio operators at two schools, Mare Island, Cal., and Harvard University, says *The Wireless Age*. Approximately 1,500 pupils, men of the regular service and the reserve, are undergoing instruction at Harvard, the buildings and facilities of the institution having been put at the disposal of the Navy by President Lowell. With the transfer of the regular Navy radio school, formerly at the New York navy yard, to Harvard, the wireless training activities of the service are now largely centered in Cambridge. The course is of four months' duration and embraces military drill as well as technical and other subjects.

Seamen and apprentice seamen are given instruction in the rudiments of radio telegraphy at the naval training stations at Newport, R. I., Great Lakes, Ill., San Francisco, Cal., and Norfolk, Va., and at the naval camps at Philadelphia, Charleston, Mare Island, San Diego and Puget Sound. Those who are able to receive ten words a minute in the continental code and who show promise are transferred to Harvard for the four months' course.

The regular navy accepts enlistments under two ratings—landsman for electrician (radio) and electrician, third class (radio). For the former rating the recruit must be able to receive twenty-five words a minute in the Morse code or ten words a minute in the continental and possess a foundation in radio. For the electrician rating possession of a commercial radio license and ability to pass an examination in electrical subjects are necessary. Upon acceptance the recruits are sent to the radio school for instruction.

Five ratings are available in the Naval Reserve: Landsmen for electrician (radio); electricians, third class (radio); electricians, second class (radio); electricians, first class (radio); and chief electricians (radio). Men are enrolled in the first two classes according to their ability in the Morse or the continental codes, in the other ratings according to their experience as commercial radio operators on merchant vessels, and other qualifications.

Enlistments in the navy or enrollments in the Navy Reserve for radio operators will be accepted at any navy recruiting station. The monthly rate of pay for radio men ranges, on the present war basis, from $32.60 for landsmen to $72 for chief electricians.

Electrolysis.

(*Continued from page* 504, *November* 1)

PROTECTIVE MEASURES: A—CORRECTING FAULTY CONDITIONS.

GENERAL.—The mitigation of electrolysis in cable systems presents several possibilities—mitigation by removal of cause, mitigation by improvement of conditions at the source, and mitigation by measures applied to the affected system. Obviously it is preferable to remove the cause, if possible, but sometimes this is so impracticable or expensive that other measures must be resorted to. It sometimes happens, however, that distinctly faulty and avoidable conditions in either the cable or railway system or neighboring pipe systems are directly responsible for dangerous electrolysis conditions, and hence such possibilities should first be looked into before more extensive measures are taken. Among the more common faults that are especially conducive to electrolysis may be mentioned the following:

IN ELECTRIC RAILWAY SYSTEMS, broken rail bonds are the most common faults. Generally poor maintenance of the track conductivity is the next. Ground plates at power stations are also contributing factors.

A potential gradient in the track of one volt per 1,000 feet, and not more than seven volts difference in potential between any two points in the track system are generally considered to accord with good practice, both values being the average during any ten-minute period during the day. Of course, the maximum potential gradients will be found in the immediate vicinity of points where negative feeders are attached. When values very much higher than these are found, it may be expected that electrolysis dangers will be considerable, and when observed values are several times greater something is probably wrong and needs correcting.

The use of ground plates in connection with negative bus-bars cannot exactly be regarded as a "faulty" condition, but it is bad practice and greatly increases electrolysis dangers. Such ground plates so increase leakage currents in railway systems that serious efforts should be made to have them disconnected whenever they are found.

IN CABLE SYSTEMS the most common fault, from an electrolysis standpoint, is contact with pipes and other metallic structures. Another condition frequently found consists of old drainage connections, track bonds, etc., which have been installed in former days and forgotten, but which no longer serve the purpose originally intended. Poor conditions in manholes, need of cable racks, and lack of cross bonds between the various cables occupying one conduit system, are other faults that are of more or less common occurrence.

Contacts with pipes, metal bridges, or steel work in buildings are liable to introduce large stray currents into a cable system. They therefore should be eliminated whenever found, unless special tests indicate that they are not harmful. In the case of contacts in buildings, if the contact cannot be permanently removed, an insulating joint should be made in the cable sheath, so as to prevent the current there picked up from flowing out onto the main cable.

Old drainage connections whose usefulness is doubtful should be removed before a survey is made. Even when they seem to be serving a good purpose, it will usually be advisable to remove them until the complete survey shows that protection cannot be more satisfactorily obtained by other methods.

The need of good conditions in manholes is obvious. No cables should be allowed to hang loose or lay on the floor of a manhole. It is also very important that all cables in a system be thoroughly and frequently bonded together before protective measures are applied.

IN FOREIGN PIPE AND CABLE SYSTEMS. In some cases positive conditions on a cable are due to the proximity of a foreign cable or pipe which has a very low potential. This low potential may be caused by an accidental contact with the railway track system, or to a regular connection provided for electrolysis reasons. When such a condition is met, an effort should be made to have the foreign system brought to a normal potential, or if it happens to be a telephone or telegraph cable, to have it treated the same as the cable system being investigated and have both systems tied together and protected by the same means.

PROTECTIVE MEASURES: B—APPLICABLE TO RAILWAY.

GENERAL. After all faulty conditions such as those outlined have been cleared up, and the cable still remains in danger of corrosion from electrolysis, consideration should be given to the possibility of mitigation by removal or modification of the source of stray currents—that is, by measures applied to the electric railway system. Obviously all such measures must aim to reduce the stray current, or what is equivalent, to reduce the potential drop in the track circuit. The principles underlying these methods have already been outlined.

TRACK BONDING. Repairing broken or defective rail bonds is of very first importance, as already pointed out. More than this is really necessary, however, for the general track maintenance should be such as to make efficient use of the rail conconductivity for carrying current.

When an electrolysis survey shows that a cable is picking up current from a railway track which has a relatively high potential to other portions of the track system, the matter should be taken up with the railway officials with a view to obtaining improved conditions. Improved track bonding may be the simplest way to bring this about.

FEEDERS TO REINFORCE TRACK CONDUCTIVITY. In some cases high potential drops in the tracks may be due not to poor track bonding, but to excessive currents flowing in the rails. When this condition exists improvement can be effected only by a rearrangement of track feeders or by the installation of new feeders to reinforce the conductivity of the existing rails and feeders.

(*To be continued*)

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are: "American Telegraphy," by Wm. Maver, Jr., "Radio Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

THE ELECTRIC GENERATOR—(*Continued*)

An amplification of this switching arrangement is shown in Fig. 1, which figure illustrates, besides, the practical connections of the machines, with the further means required to speedily change from either of the "permanent" series to the "spare" series. SW is a switchboard. The discs 1, 2, 3, 4, 5 on SW are large, metallic discs of ordinary form, with semi-circular notches to receive metallic plugs. Discs 1, 1, 1, 1, 1 are connected to the wires leading to the generators of the regular positive series. Discs 2, 2, 2, 2, 2 are connected with the wires leading to switchboard or line wires; discs 3, 3, 3, 3, 3 with the machines of the spare series (two of them via the commutators or reversing switches), and discs 5, 5, 5, 5, 5, with the "permanent" negative series of machines. Discs 4, 4, 4, 4, 4 are also connected with wires leading to the switchboard in the operating room.

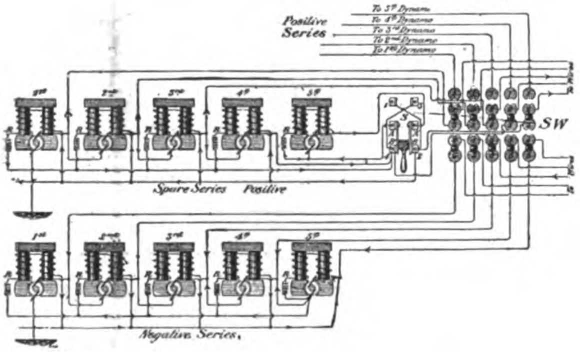


FIG. 1—WESTERN UNION ARRANGEMENT OF GENERATORS.

In the figure, discs 2, 2, 2, 2, 2 and discs 3, 3, 3, 3, 3 are connected together by plugs. So also the discs 4, 4, 4, 4, 4 and 5, 5, 5, 5, 5. This places to the wires the "permanent" negative series and the spare series furnishing positive polarity. If it is desired to release the "spare" series and to place in operation the permanent or regular positive series, plugs are first inserted between discs 1, 1, 1, 1, 1, and 2, 2, 2, 2, 2. This places the two series in parallel. When this has been done the plugs between 2, 2, 2, 2, 2 and 3, 3, 3, 3, 3 are then removed, freeing the spare series. Should it be required to release the regular negative series, the commutator S is so placed as to cause the spare series to become negative, after which plugs are inserted between discs 4, 4, 4, 4, 4 and 3, 3, 3, 3, 3. This also places the spare series in parallel with the regular negative series, whereupon the plugs may be withdrawn from between 4, 4, 4, 4, 4, and 5, 5, 5, 5, 5; thereby releasing the regular positive series. By thus running like series in parallel momentarily no break is caused in the line wire circuits. Resistances, amounting to about 2.5 ohms per volt of electromotive force, are placed between the generators and each wire circuit, for the reason stated. These resistances are incandescent lamps. They were substituted for coils of German silver wire because of the frequent breakages of the fine wire of the coils which occasioned delays. The lamps have been found to give satisfactory service.

QUESTIONS IN TELEGRAPHY.

How are the discs of the generator-switch connected together and disconnected?

What is the resistance of the incandescent lamps which are placed between the generators and each wire circuit?

Why were incandescent lamps substituted for the coils of German silver wire formerly used for artificial resistance?

Telephony.

RETARDATION COILS.—(*Continued*)

Fig. 1 shows the use of a retardation coil in connection with a central office storage battery and charging generator. The current supplied by an ordinary direct current generator is not absolutely continuous, but contains a small element of high frequency current which would produce noise if allowed to enter the battery. In this connection, therefore, the function of the retardation coil is to prevent these noise producing currents from entering the battery.

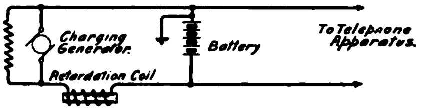


FIG. 1—RETARDATION COILS.

The coil is also used to allow both telephone and telegraph currents to be sent over a single wire with a return circuit through the ground. In such a circuit, a condenser is placed in series with each telephone instrument, and a retardation coil in series with each telegraph instrument. The condenser allows the high frequency talking currents to flow freely through the telephone instrument, but cuts off entirely the direct current impulses of the telegraph instrument. The retardation coil, on the other hand, keeps the telephonic current from being wasted by passing through the telegraph instrument, but at the same time permits a ready flow of the telegraph impulses.

A more common use of the retardation coil is shown in Fig. 2. Here we have a double wound retardation coil, similar to Fig. 1 (November issue), used as a battery feed coil in the private branch ex-

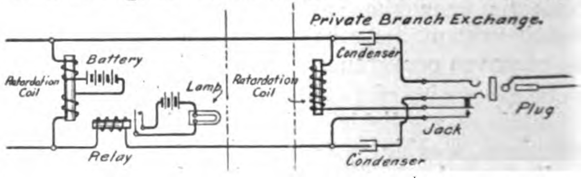


FIG. 2—COMMON USE OF RETARDATION COIL.

change, where we may have a number of different conversations being carried on at the same time by means of transmitter current supplied from a common battery. In this connection the retardation coil allows direct current to pass to the several transmitters, but prevents the talking current from being wasted by passing through the battery.

(To be continued)

Radio Telegraphy.

CONDENSERS—*(Continued)*

Another type of condensers having some advantages is the Moscicki jar, which consists essentially of a glass tube or jar with inside and outside coatings, as in the other types, but at the edges of the coatings where the puncture usually takes place the glass is thickened to give increased strength, and at the same time the edges are covered with an insulating liquid to stop the brush discharge. The whole is contained in a brass tube to which the outside coating is connected, the inside coating being brought out to a binding post through a sealed porcelain insulator. The case and the binding post thus become the two terminals. These tubes are made in two sizes, the larger of which is in more general use, has capacity about 0.005 and is capable of withstanding 20,000 volts.

There are many other types of condensers using such dielectrics as mica, paper, and various molded insulating compounds. In a few cases oil is used as the dielectric, in which case metal plates are mounted on insulating supports a short distance apart in tanks filled with a suitable insulating oil, such as castor oil, etc.

TRANSMITTING INDUCTANCES.

The function of the inductance is to form one of the two elements, the condenser being the other, necessary for developing and maintaining the oscillations, and to serve as a means of transferring energy from one circuit to another. An ideal coil would be one having the desired inductance but with a zero resistance to the oscillating currents.

The inductance coil L, which has been shown in the various figures, may be any one of several different types, such as a helix of heavy copper wire, thin-walled copper tubing or flat strips, or a flat spiral of copper ribbon, such as the linking coil of the early Signal Corps field radio sets, etc. These are generally provided with clips so as to be able to vary continuously the number of turns, and hence the inductance in circuit. In any single coil, the fewer the number of the turns the less will be the inductance, and vice versa, the larger the number of turns the greater will be the inductance. In some cases the coil may be provided with plugs and sockets to vary the inductance by steps and other means provided elsewhere in the circuit to get all adjustments between the steps.

Curves showing how the inductance of a coil varies with the numbers of the turns in circuit is called a calibration curve of the inductance. In Fig. 1 is shown such a curve for a helix, with square turns wound with copper tubing about one-fourth inch in diameter, the length of each side being twenty-one and one-half inches and the spacing of the turns being one inch between centers. In Fig. 2, A and B, are shown two calibration curves of a flat spiral, similar to the one used in the field radio sets, in the first of which (A) the turns are counted from the outside inward, and in the second (B) they are counted from the inside outward. Thus it is seen that in using different numbers of turns in a flat spiral care must be taken to state how the turns are counted. The explanation of the difference between the two curves is that, other things being equal, the greater the diameter of the turn the larger will be the inductance, and hence the inductance will be the larger for a few turns in that curve in which the turns are counted from the outside inward.

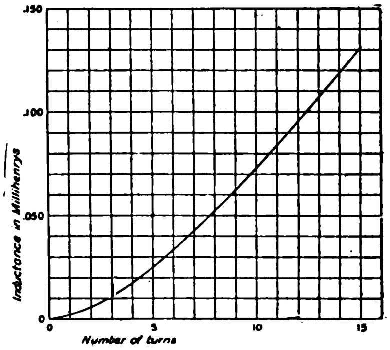


FIG. 1—CURVE FOR HELIX WITH SQUARE TURN.

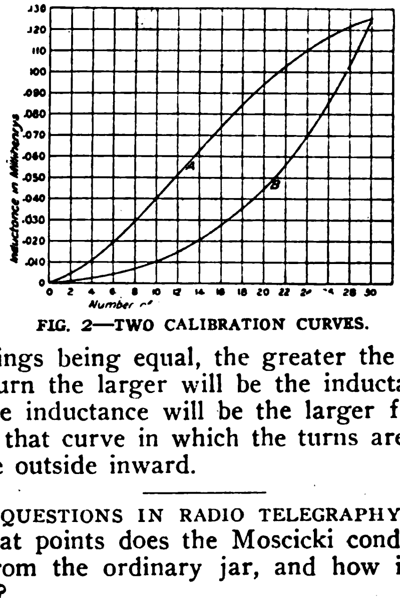


FIG. 2—TWO CALIBRATION CURVES.

QUESTIONS IN RADIO TELEGRAPHY.

In what points does the Moscicki condenser jar differ from the ordinary jar, and how is it constructed?

What are the various dielectrics used in condenser construction?

Where does a condenser, with glass as a dielectric, usually break down under excessive voltage, and what is the probable cause of such failures?

The Western Union Multiplex.

SYNCHRONISM.

From what has been stated, it will be understood that an essential requirement of such a system is that the rotating contact brushes at the two ends shall maintain practically the same phase relation with respect to each other; that is, the two sets of brushes must be made to rotate in synchronism. The apparent solution of the problem is to provide means for correcting the phase relations at frequent intervals. Some thirty years ago Baudot accomplished the result by using weight-driven motors with sensitive governors to maintain a nearly constant rate of rotation. One motor was adjusted to run slightly faster than the other, and means were provided for correcting the phase of the brushes at the fast end once per revolution if correction is required. This was accomplished by mechanically stepping back the brushes whenever they had gained an appreciable amount on the brushes at the slow end. The practicability of this method has been demonstrated by the extensive use of the Baudot system in Europe. On the other hand, this method is wasteful of line time, since it is necessary to transmit a special signal once per revolution. Moreover, the type of motor used by Baudot does not permit of readily changing the speed, and is one in which the speed depends on a number of variable factors. It will be seen then that the ideal system is one in which no extra line time is required for maintaining synchronism, one which will permit of quickly and conveniently changing the speed of rotation of the brushes, and one in which the constancy of speed of rotation does not depend upon a number of variable factors. This has been accomplished in this system, and the means employed are briefly as follows:

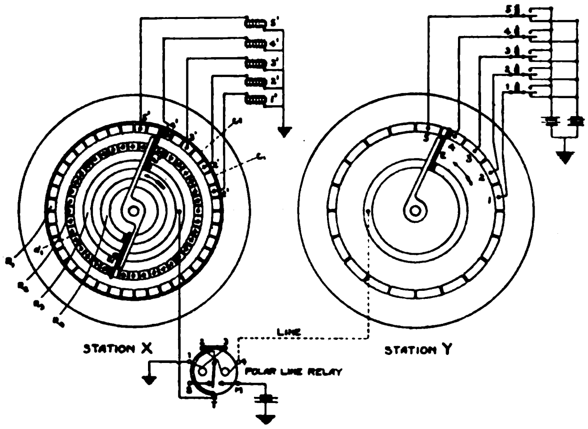


FIG. 10—HOW SEGMENTS ARE CONNECTED.

Referring to Fig. 10, it will be noted that segments 1 to 5 at station Y are connected to levers, 1, 2, 3, 4 and 5, so arranged that they may send to the line positive or negative current, depending upon their position. The brush E connects these segments consecutively with the solid ring which is connected to line. At station X the line is connected to ground through the windings 1, 2, 3 and 4 of a polar relay. The tongue T of this relay is connected to the solid receiving ring R_3. The marking contact M of this relay is connected to a grounded battery, and when negative current from the distant end is passing through the relay, the tongue rests on the spacing contact S. As the brush E_1 rotates, it connects the solid receiving ring R_3 with the receiving segments 1^1, 2^1, 3^1, 4^1 and 5^1 of R_1 consecutively.

QUESTIONS ON THE MULTIPLEX.

What is the essential requirement in maintaining synchronism?

How did Baudot secure synchronism?

What is the ideal system of synchronism?

Shop Talk.

BY THE OBSERVER.

Regardless of all that has been written about the proper maintenance of power plants, the abuse still goes on. Sometimes, I think of the old saying: "What are laws for if they are not to be broken." The laws pertaining to electricity and magnetism are so often disregarded, it is really wonderful that there is not more electrical machinery "put out of business." It was only a short time ago that I walked into a very well installed motor-generator plant, and the attendant very courteously showed me around. Part of the show consisted in his starting one of the idle machines. The motor side was alternating current. He grabbed the switch, threw it to position marked "start." Of course, that was all right, but hardly had the armature made a few revolutions when he yanked the switch to "run." I thought the armature was going to climb up to the ceiling, or roll along the floor, for had not the machine been a good one something like an open coil or short would have resulted. I told him in the nicest manner I could that he should wait until the armature had picked up speed before he placed the switch on "run." Now this is absolutely necessary to prevent an unnecessary strain upon your alternating current motor.

In all telegraph offices it is customary to shift the machines every four hours—quite a good idea—but how many of you wait until your armatures pick up speed before you throw your switch to "run"? You may think you are getting away with such abuse but you are not. You are daily undermining and giving your machine "general debility" and you will regret it when it is too late. Sooner or later the shorts and opens will develop and then your troubles will be many. It will then be a case of where "haste made waste." The same remarks apply to the starting of direct-current motors and in fact more so than the alternating current. The usual starting voltage on direct current is 220 volts, whereas the resistance is less than an ohm. Now to try and start such a motor without any resistance would mean about 400 amperes, whereas the safe carrying capacity of the wires is not one-tenth of that. Think of that. Oh yes, you have a starting rheostat, but as it takes a few seconds for the counter-electromotive force to develop, you will not wait, but try to see how quickly you can swap your machines without blowing your fuses. You wonder then why you are having so much trouble with your plant. I do not, but I am amazed that you have any plant in working condition. On the old style starting rheostats there was a little tag which read: "Turn on slowly." The same rule stands today and unless the whole science of electricity and magnetism changes it will stand forever.

(To be continued)

Raising Taxes.—A manager in a Western city recently received a communication from the city council to the effect that as the telegraph company was raising new poles to take the place of old ones, the town found it necessary to raise the taxes on them.

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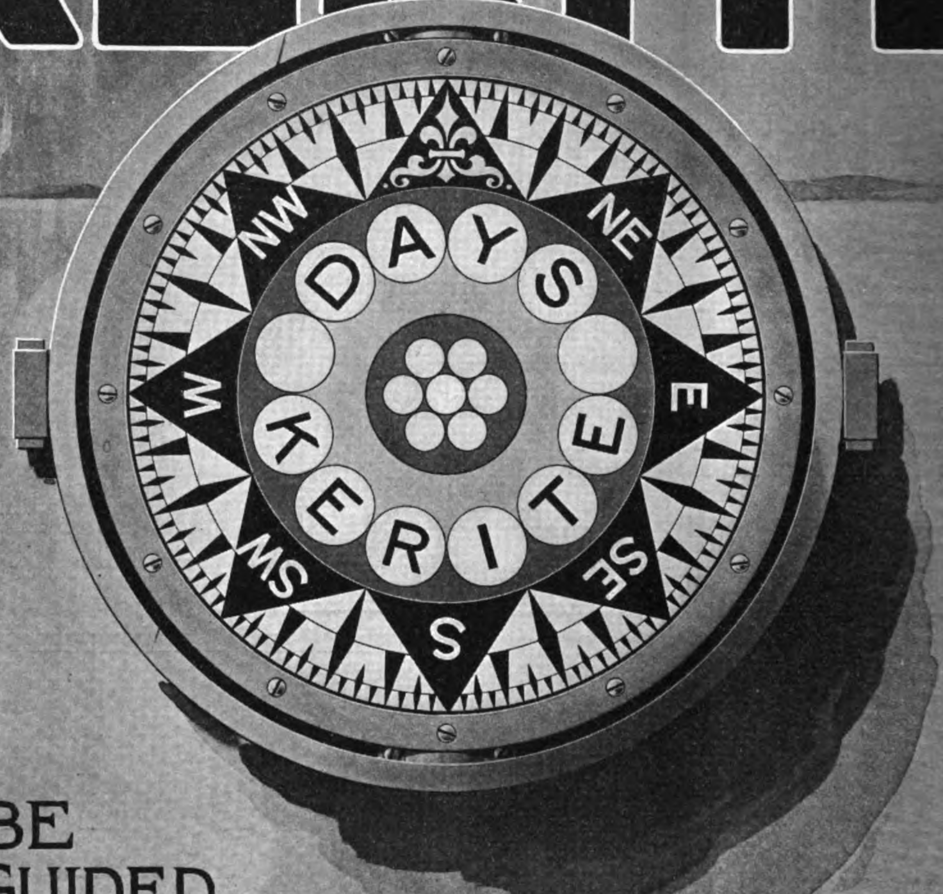

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THE RAILROAD.

Special Meeting of Railway Telegraph Superintendents.

Mr. M. H. Clapp, of St. Paul, Minn., president of the Association of Railway Telegraph Superintendents, was in New York a few days during the early part of the month, in connection with the special meeting of the association, to be held at the La Salle Hotel, Chicago, on November 22. Mr. Clapp states that the meeting will undoubtedly be one of much interest, and that there will be a large attendance.

The important work of the meeting will include a consideration of:

1. Conservation of telegraphing and telephoning in connection with both commercial and railroad wires. Messrs. Cellar, Chenery and Keenan constitute the committee having this subject in hand.
2. Shortage of operators and plans for schools to teach operators. Special Committee No. 7, Railroad Message Traffic, Mr. F. T. Wilbur, chairman, will consider this subject and report to the special meeting.
3. Emergency use of wire facilities in operation of railroads to meet the present war situation.

Mr. W. L. Connelly, Gibson, Ind., is secretary of the Association.

The Eastern Division of the association will hold a meeting at 9 a. m. at the same place and on the same day. After a brief session for the consideration of matters pertaining to the Eastern Division, the meeting will merge with the special meeting.

Mr. W. P. Cline, superintendent of telegraph, Atlantic Coast Line, Wilmington, N. C., is chairman of the Eastern Division.

L. D. Shearer, Superintendent of Telegraph, Philadelphia and Reading Railway Company.

Mr. Llewellyn D. Shearer, whose appointment as superintendent of telegraph, Philadelphia and Reading Railway Company, was announced in our October 16 issue, was born in Robesonia, Pa., December 18, 1870, at which place, on July 7, 1888, he entered the telegraph service as operator for the same company.

His entire business career has been passed in the service of the Philadelphia and Reading Railway, and he has filled, successively, the positions of operator, train dispatcher's operator, auditing clerk in the office of the superintendent of telegraph, and chief clerk to this official.

American Telegraphers Who Have Made Good.

The question is frequently asked: Why do so many telegraphers forge to the front? The answer is found in the fact that telegraphy sharpens the wits and makes a person keen and resourceful. A young man entering the railroad service in the telegraph department has a fine opportunity to learn the ins and outs of railroading. He frequently comes in contact with the higher officials and, if he is made of the right kind of stuff, soon gains recognition.

The starting point of the railroad presidents of these and older days was telegraphy. The list is full of operators, and among the names are found those of Van Horn of the Canadian Pacific, Hays of the Grand Trunk, Oakes of the Northern Pacific, Earling of the Milwaukee, Hughit of the Northwestern, Webb of the Katy, Calvin of the Union Pacific, Scott of the Southern Pacific, Ripley of the Santa Fe, Brown of the New York Central, and scores of others who went from the sounder to the scepter.

While telegraphy may not be as remunerative as some other lines, it is a great incubator, and many of the greatest editors and most brilliant writers graduated from the telegraph key.

Mr. F. F. Reifel, superintendent of the Detroit division of the New York Central Lines at Detroit, Mich., has been appointed superintendent of the Michigan division with office at Toledo, Ohio. Mr. Reifel was formerly superintendent of telegraph, New York Central Lines at Cleveland, Ohio.

Mr. F. J. Nicholls has been appointed telephone inspector and line supervisor, Southern District, Southern Pacific Company, with headquarters at Oakland Pier, Cal., vice Mr. G. W. Palmiter, promoted.

Mr. L. L. Leech, formerly manager of the Atchison, Topeka and Santa Fe Railway, Albuquerque, N. M., has been advanced to the position of manager and wire chief of the Los Angeles office of the same company.

Morkrum Printers on Southern Pacific.—The Southern Pacific Company has installed a Morkrum printer circuit between Ogden, Utah, and San Francisco, Cal.

Telegraph Rate Expert.

The United States Civil Service Commission will hold an open competitive examination for telegraph rate expert until December 4. Applicants must show that they are telegraph operators; that they have performed telegraph accounting work; and that they are perfectly familiar with the rules used in settlement for service performed for the Government. They must have had at least three years of such experience, the greater part of which was telegraph accounting. They must have a thorough knowledge of rates, combination of rates, routings, and methods of billing in use by telegraph companies. They must have had a good common school education.

The duties of appointees will consist of the revision, preparation, audit and payment of telegraph and cable accounts.

Applicants should at once apply for Form 1312, to the Civil Service Commission, Washington, D. C.

Wire Chief (over the telephone): "Send up to the apartment a quarter's worth of ham."

Butcher: "All right, sir. Anything else?"

Wire Chief: "Yes; if my wife isn't at home tell the boy to put it through the keyhole."—*Mountain States Monitor.*

Death of Jeff W. Hayes.

On Sunday, November 4, in the beautiful little chapel of Graceland Cemetery, Chicago, amid a mass of flowers and evergreens, with the streaming sunlight of a bright afternoon shedding warmth and inspiration over the scene, the last rites were performed over the remains of Jeff W. Hayes, who passed away at his home, 5353 Glenwood Avenue, Chicago, on November 2, as the result of an operation performed in Portland, Ore., a few weeks previously. There were present, beside the immediate family of the deceased, the principal telegraph officials of Chicago, headed by C. H. Gaunt, general manager of the Western Union, and E. W. Collins, general superintendent of the Postal Telegraph-Cable Company. The ceremony was a mark of respect and sincere regard for one of the most widely known enthusiasts and writers the telegraph profession has produced in the United States.

It can truly be said that Jeff Hayes had a message for all telegraphers—a message of stimulation for the honor and dignity of the profession everywhere. He saw, even with his sightless eyes, countless ways of promoting cheer and fellowship. He devoted himself to the task of creating in the minds of all knights of the key the highest possible regard for their chosen vocation, and a profound respect for everything connected with the administration of it. He knew personally every official connected with the telegraph in the United States, and almost every Morse operator. He used the commonplace circumstances of telegraphers' lives as themes for bright and inspiring stories, of which he wrote hundreds, and always with the purpose of bringing to view the buoyant, cheering and intellectual influences that surround the men who work the Morse wires, but which require the magic touch of the zealous writer to cause such influences to be deeply felt and appreciated.

Mr. Hayes never overlooked an opportunity to exalt a good deed which he learned of. He gave publicity in the widest way within his means to the admirable traits of those with whom he came in contact, and in his endless travels he always sought to magnify the influences which create contentment and concord, and to elevate, strengthen and sustain the men who constitute the great body of Morse telegraphers of America and Canada.

Since Mr. Hayes lost his sight some twenty years ago he has been endowed with a wonderful vitality and industry, and his capacity for work and almost continual travel have astonished those who watched his activity in the closing days of his life. Last winter, notwithstanding a severe personal obstruction that had been placed in his path, he set out again, with remarkable spirit, upon a trip embracing the entire West. He was alone, and secured the aid only of local guides to lead him about the various places he visited. But he covered a distance of nineteen thousand miles in the coldest weather, distributing his literature and gathering material for more stories and anecdotes relating to the profession in which he saw so much good. Some of these stories have been published and others were in preparation when the Reaper cut him down.

Certain inspiring and fascinating sentiments have always been connected with the operation of the Morse telegraph, because of the mysterious and subtle wire connection between the widely separated men who manipulate the electrical pulses. The system itself appeals to the imagination. There are inherent personal pleasures in telegraph signaling, and irresistible attachments to the work itself that lead men to adhere to it when a more mechanical operation would drive them away. Mr. Hayes wrote of the delightful and pleasurable side of the telegraph, of the weird and strange combinations of human experiences which have arisen in the profession, and the love and happiness and kindness that have been stimulated by the wire connection between individuals. He enlarged upon the wealth of knowledge that has been created and circulated by the telegraph, and he dwelt always upon the activities and opportunities of those who follow the telegraphers' profession.

The pallbearers were: Edward F. Wach, assistant chief operator, Western Union, Chicago; A. E. Tyler, assistant chief, Board of Trade, Chicago; John R. Magill, ex-manager of the *Globe-Democrat* office, St. Louis; E. W. Collins, general superintendent, Postal, Chicago; T. R. Powers, chief operator, and Charles W. Potter, assistant chief operator, Postal, Chicago.

The early life of Mr. Hayes, who was sixty-four years of age, was spent in Cleveland, Ohio, where he was identified with the Western Union Telegraph Company, beginning as a messenger. Soon developing into a first class operator, he worked in various Ohio cities between 1870 and 1875, and located in St. Louis in the latter year. While in that city he founded a telegraph paper called the *Electric*, which was devoted to telegraphic gossip. From St. Louis Mr. Hayes went to Omaha, Neb.; later to Salt Lake City, Utah, and eventually to Austin, Nev., where he became the editor of a daily paper. Becoming interested in mining, he built several telegraph lines through California and Nevada. A few years later he was appointed manager of the Western Union Telegraph Company at Portland, Ore., which position he held until 1891, when he was appointed manager of the Postal Telegraph-Cable Company, in the same city, which position he held for several years, when he had the misfortune of losing his eyesight. He then conducted a messenger service until about 1905, since when he has given his entire time to telegraphic literature.

Mr. Hayes, in connection with Mr. P. G. Tompkins, of Los Angeles, in 1913, established the *American Telegrapher*, which continued publication for about three years, Mr. Tompkins having withdrawn from its management at the end of the first year.

Mr. Hayes' articles in TELEGRAPH AND TELEPHONE AGE on the "Pleiades Club"—a novel conception—the publication of which had just terminated, will be long remembered by the fraternity. In a letter dated October 24, to the publisher of this paper, Mr. Hayes, in referring to these articles, stated "The Pleiades Club has had its day so far as the AGE is concerned, and I will be glad to give the space to matters more interesting."

Mr. Hayes is survived by a wife, a son and a daughter.

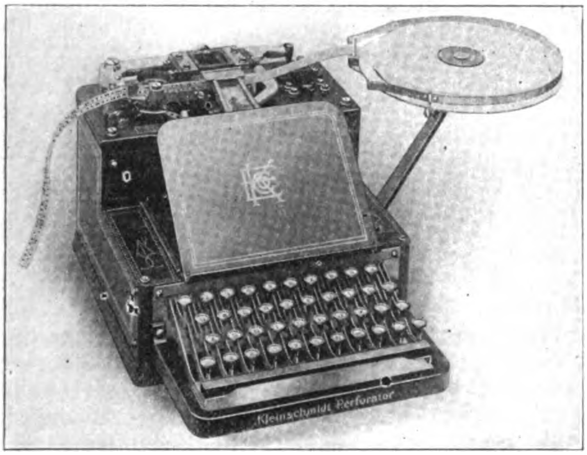
The Kleinschmidt Keyboard Perforator.

The keyboard of the Kleinschmidt perforator, which is now in extensive use by many telegraph and cable companies and on newspaper circuits, is arranged in accordance with the standard typewriter layout, as shown in the accompanying illustration of the instrument.

It is composed of forty-three keys and a space bar, which permits of the use of five special keys in addition to the alphabet, figures, blank and combination key. This latter key is provided so that any combination not included in the keyboard may be perforated by combining two or more keys. It is a free acting keyboard, capable of operating at any speed up to about six hundred letters a minute.

The selecting mechanism is so constructed that it can readily be adapted to perforate any one of the standard or special telegraph codes. This makes the machine as near universal as it is practical to build.

All parts of the machine have been made interchangeable by using special dies and fixtures in their manufacture. Worn and broken parts can be readily replaced and the perforator kept in good working condition with a minimum of trouble. The whole mechanism is simple and built along scientific lines, giving the machine a long life with low maintenance charges.



KLEINSCHMIDT PERFORATOR.

The dies and punches are easily removed in a unit for sharpening, and are interchangeable, so that when the die and punches become dull a spare set may be put in their place without any change of adjustments.

Power for operating the machine is supplied from a single solenoid, which can be wound for any voltage up to 250 volts. The power consumed is about the same as that for an eighty-watt lamp, or about seven-tenths of an ampere at 110 volts. Electrical troubles are almost nil, since but a simple make and break circuit is required.

From an operating standpoint, the machine compares with a good typewriter. The keyboard has a very light and even touch, making it well adapted to the touch system of operation. More than twice as much business can be perforated with it as can be done with the Mallet perforator. The reason for this is easily understood when it is considered that but a single motion is required to perforate a complete character, as compared to from two to eight with the Mallet perforator. This increase in the output of each operator allows for the careful inspection of the tape, as well as greatly reducing the strain under which he works.

The size and weight are likewise commendable, requiring the same table space as a typewriter, and it is practically the same weight. The machine operates very quietly, even at high speed.

Where it is desirable to eliminate all possible noise, the perforator can be equipped with a mahogany silencer case. The cover lifts to expose the working parts of the perforator, making it easily accessible for inserting the tape, replacing the die and making simple adjustments. The tape magazine is in the side of the cover, which makes a very compact construction. To enable the operator to read the tape as it is perforated, a glass window is inserted in the top cover.

At news distribution centres, machines that will perforate more than one tape at a time are often found desirable. Accordingly a machine that will perforate as many as four tapes at a time has been placed on the market.

These perforators have been installed in the offices of the various telegraph and cable companies throughout the world and are giving excellent satisfaction in every case.

Among the users of this perforator are: The Mexican Telegraph Company in its New York office, Western Union Telegraph and Cable Company, Commercial Cable Company, British Postoffice, Royal Swedish Telegraphs, Danish State Telegraphs, Central and South American Telegraph Company, Atlantic Communication Company, Washington Alaskan Military Cable System, Pacific Cable Board, Commonwealth of Australia, Union of South Africa, Federal Telegraph Company, and many foreign newspapers.

The Dinner Pail.

Mr. Addison C. Thomas, formerly superintendent of the Western Division of the Associated Press, Chicago, is the author of a book of 127 pages, just published, and entitled "The Dinner Pail." The contents of the book consist of a miscellaneous collection of articles on the effects of the war on this country, pointing out the importance of preparing to free and feed the world. It is inspirational throughout, and gives facts that are calculated to set us all thinking. It contains portraits of many well-known people who are leaders of thought and action at this time.

One of the most interesting chapters of the book is the facsimile reproduction of the handwriting of Mr. John P. Boughan, a former Associated Press operator, and now in the news service. The copy is certainly beautiful, and will be a delight to the eyes of every reader. It is very much like Mr. Thomas A. Edison's handwriting, and is as clear and unmistakable as type print.

Copies may be obtained of TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

INDUSTRIAL.

The First Alternating Current Sounder.

Mr. John B. Schwab, superintendent, Western Division, Tuscarora Oil Company, Ltd., Harrisburg, Pa., states that the first Ghegan alternating current sounder placed in actual service was installed in his office May 30, and that the operators like the sounder fully as well as they do the ordinary direct-current sounder. The adjustment of the instrument has never been altered, being the same today as on the day it was installed. The instrument has never developed any weakness and has given perfect satisfaction. Mr. Schwab's experience with the alternating current sounder is the same as that of other users of this type of instrument. These sounders are made by J. H. Bunnell and Company of New York and are now regarded as standard.

The J-C Repeater on Railroad Circuits.

The Jester-Cooper Company, Houston, Tex., manufacturers of the J-C telegraph repeater system, will present a report before the meeting of the Association of Railway Telegraph Superintendents, based upon the replies returned from the various superintendents as to the operation of this well-known repeater on railroad circuits. The replies, it is said, were very favorable. Mr. J. H. Finley collected the data for this report, which will make a satisfactory showing for this instrument.

The great advantage of this repeater is that no local batteries are required, thus doing away with the high costs of battery material and the annoyance and waste of time in maintenance.

This repeater is used by the United States War Department, as well as by the principal railroads.

Diaphragm Sounders at the Front.

The Railways Labor-Saving Device Company, Davenport, Iowa, recently shipped fifty diaphragm telegraph sounders to the general supply depot, United States Expeditionary Forces in France, for use in connection with military operations in that country. This is the third order received from the government for diaphragm sounders. The other two were for sixty or more instruments for use on the government lines between Seattle and Alaska.

The company has also received an order from the Brisbane Electrical Company, Brisbane, Queensland, Australia, for several sounders. The outlook for extensive use of these instruments in that country is reported to be favorable. See advertisement on page VIII for further information.

Electrical Supplies for the Army and Navy.

Mr. O. D. Street, assistant general sales manager of the Western Electric Company, New York, recently delivered a talk at the War College in Washington, before a group of military authorities in charge of handling supplies for the various branches of the military service. Mr. Street's talk dealt with the company's plan of purchasing, warehousing and distributing supplies.

The company has been coöperating with these officials at Washington, who are being called upon to solve the growing problem of handling and accounting for the immense volume of supplies which will be used by the Army and Navy, and one of the results has been the establishment of the Western Electric system in the Quartermaster's Depot at New York and in the Medical Supply Depot at New York.

A Worthy School.

The New York Electrical School, 445 West Seventeenth Street, New York, is filling a gap in the educational agencies that the public, unfortunately, does not realize as much as it should.

The school is training scores of young men who are ambitious to rise above the mediocre life and become a master in the electrical arts and trades. Its system of instruction combines theory and practice, so that what the student learns in theory he proves by practice—in other words, he works with his hands as well as with his head. After a course in this school the graduate stands on the threshold of a future full of promise, if he will apply his knowledge with determination.

The school is gaining in popularity every day, and many telegraphers who have taken the course express themselves as more than pleased with the results achieved.

Every ambitious young man should look carefully into the work of this school; it is worth while.

American Telegraphy.

Maver's "American Telegraphy" has been the standard book on American telegraph engineering for over twenty years. Its utility as an instructor of students of telegraphy is well attested by the recent purchase of over 1,000 copies of this work for the use of the Signal Corps of the United States Army. Mr. Howard H. Arthur, at one time an operator on the Atchison, Topeka and Santa Fe Railroad, now a successful real estate operator in New York City, says that after one reading of the description of the quadruplex in "American Telegraphy" he was able to and did take charge of the quadruplex circuits in the office where he was a young operator. An officer in the Signal Corps recently stated that the clearness of the descriptions in that book was one of its marked characteristics.

Sent, carrying charges prepaid, on receipt of price, $6.00, to any address. Send orders to John B. Taltavall, publisher, Telegraph and Telephone Age, 253 Broadway, New York.

Books for Holiday Gifts.

As the holiday season approaches, our minds are naturally directed to the subject of presents. There is nothing more appropriate and satisfactory to the recipient than a useful book, and for telegraph and telephone people—especially students—educational books along these lines are most acceptable.

Telegraph and Telephone Age sells any electrical book published and will be pleased to receive orders. We will be glad to send book catalogues to those who wish to purchase.

Life on the Ocean Wave.

BY C. M. HOLMES, NEW YORK.

Back in the '70's the Western Union Telegraph Company was taking up the old cables at the foot of Fifteenth street, North River, New York, and laying new ones from Fifty-ninth street, over to Weehawken, N. J., using a scow and the cable steamer "William Orton." One day when we were about three-quarters over the river we could not budge the cable. As it was getting dark, Captain Mackintosh, superintendent of construction, concluded to knock-off for the day and tackle the job again in the morning, but some one, he said, would have to stay on the scow all night, so I was appointed captain for the night. A couple of lanterns were given me and after having secured the cable, the "Orton" steamed over to New York leaving me alone on the scow, pacing up and down the decks like a real captain. Things ran smoothly until about midnight when a boat in which there were a couple of river thieves rowed alongside. They came aboard and looked around, but not seeing anything they could take away, they spoke a few words to me and departed.

In the morning about six o'clock, the "William Orton" returned, bringing a pot of hot coffee and some sandwiches for my refreshment after my all-night vigil.

It was low tide when the scow was secured to the cable the night before, but during the night as the tide rose, the scow, in being lifted by the rising water, pulled the cable loose from its fastening, whatever it was. It seems that some time before a vessel had dropped her anchor on the cable and, becoming foul, the anchor chain was cut, which left the anchor laying on the cable. In time the anchor sank in the mud and held the cable fast.

We got the cable up finally and started for New York and put it ashore. As I had been up all night, Captain Macintosh gave me leave of absence for the rest of the day and told me to report for duty next morning. This was the first vacation I had had in over a year.

It was a new thing for me to be up all night, and I was none the worse for my experience with river thieves. I was thankful, however, that there was nothing aboard that the river thieves could carry away. I don't know what might have happened to them—or to me.

The Binding Wires.

The first great impetus that the telegraph received after its invention was given by the Civil War, says the Toledo *Blade*. The government lifted restrictions upon its use which, for purposes of economy, it had placed on government servants. Newspapers which hitherto had depended mostly on the mails began to depend mostly on communication by wire. Private citizens who had considered the telegraph more or less of a luxury found it nearer a necessity. Now, we learn, a new war has given the telegraph another mighty spurt. The demand for swift and still swifter communication has compelled an enormous increase in the telegraph service of Washington. The making of a new army, the mobilizing of industries, the commanding of the military sent abroad, the meeting of the multitudinous emergencies of preparation—all these have caused the government to turn to the telegraph rather than to rely on the slower mails. But not in government offices alone has the change come. Business men use the telegraph more than they ever did before. Instead of heaps of letters and a telegram or two, the manufacturer finds on his desk these mornings a sheaf of telegraph messages and a smaller number of letters. The dissemination of news by wire has probably more than anything else knit the country together, obliterated lines, and made sectional prejudices languish. No country can exist as a number of little countries when every part of it is in intimate touch with every other part. In the present crisis the telegraph and telephone wires serve anew as links that bind us all together.

Association of Corporation Schools.

The National Association of Corporation Schools has been organized to promote specialized education of employes of corporations in order to meet the problems arising from the industrial and commercial transformation brought about by the war. In the conflict for business, brains will win, and brains means specialized training.

The association is not antagonistic to other educational agencies, but coöperates with the public school, the part-time continuation school, industrial and evening schools, and has won the hearty endorsement of educators throughout the country.

Among the corporations that are members of this association are the Western Union Telegraph Company, the American Telephone and Telegraph Company, the Western Electric Company, the New York Telephone Company, the Bell Telephone Company of Pennsylvania and other associated Bell Telephone Companies, the General Electric Company, the Westinghouse Manufacturing Company, and many other well known industrial concerns.

The president of the association is J. W. Dietz, of the Western Electric Company.

Further information regarding the association and its work may be secured from the executive secretary, whose address is Irving Place at Fifteenth Street, New York.

NARROW ESCAPE OF TELEGRAPH COMPANIES.—After a lively discussion in one of the city councils in regard to raising an additional tax to meet the increasing expenses, it was suggested to impose a tax on all telegraph poles. After the ordinance had been agreed to it was discovered that neither of the two large telegraph companies had any poles in the city and those that were standing were owned by the municipality for fire alarm and police telegraph purposes.

FIRST TRANSCONTINENTAL TELEGRAPH LINE.—October 25 was the fifty-sixth anniversary of the completion of the first telegraph line from the Atlantic to the Pacific.

Preparing for Advancement.

The man who hopes to fill a higher position than the one he now occupies has our utmost respect and moral support, but he who would like to advance but is not willing to exert himself to do so is hardly deserving of consideration. There are many persons of the latter class, but he who is willing and energetic is the one who succeeds in the end.

A good practice for the ambitious operator is to study the methods of the man who now occupies the position he has his eye on. Do not criticize him in any way, but just fall in line with him and help him all you can, by word and deed. It requires a well balanced mind to do this without giving offense, and if nature has not already endowed you with such a mind you can acquire it.

As we said before, study your man. Note how he does things under changing circumstances, and, if his methods seem to you to be about right, thinking of them will become part of your mental makeup and you will unconsciously become like him to some extent.

If, on the other hand, he does not do the right thing at the right time, your analytical mind will reveal the fact. The important thing is to observe and think.

Then, study yourself, besides studying the other man. There is much in yourself that can no doubt be corrected. Compare the two men—yourself and the other fellow—and note the shortcomings of each. You cannot correct the other man's failings as well as you can your own, but under no circumstances should you neglect to remove the beam from your own eye first.

To improve yourself means work—mental work and physical work—but the satisfaction that follows overcoming is worth the effort.

Telegraph and Telephone Course.

The College of the City of New York has established an evening telegraph and telephone course as an introduction to practical operating methods and commercial systems in telegraphy and telephony. There will be lectures and illustrative laboratory experiments on the following topics: General telegraph equipment, general telephone equipment, telegraph city concentration units, Atkinson repeater, magneto switchboard, coin collector telephone stations, line faults and tests, duplex telegraphy, quadruplex telegraphy, common battery telephone switchboard, artificial telephone lines and transmission tests, Wheatstone high speed telegraphy, simplex submarine cable telegraphy, terminal and outdoor construction.

The material in this course is specially chosen so as to make it of value to employes of telephone and telegraph companies who desire advancement, and who may expect to secure this by mastering something of the methods used in everyday transmission of traffic.

The Western Union Telegraph Company gave all the equipment for the course and fitted up the laboratory.

More Congratulations.

Among the most recent congratulations received from our friends on the thirty-fifth anniversary of this journal are the following: A. R. Martin, Literary Society, Heart's Content, N. F.; Chas. E. Thatcher, formerly manager of the Western Union Telegraph Company at San Francisco, Cal., now assistant to general manager, East Bay Water Company, Oakland, Cal.; Frank E. Fisher, of the executive office, Commercial Cable Company, New York; A. L. Wellington, chief clerk to Superintendent E. Boening, Western Union Telegraph Company, Detroit, Mich.; W. F. Muth, an old-time telegrapher, now a broker in Newark, N. J.; F. A. Stumm, an old-time and military telegrapher, now living in retirement at Arcola, N. J.; Jos. Uhrig, formerly with the Western Union Telegraph Company at Chicago, now in the real estate business in that city; and N. T. Collette, of Seattle, Wash., an old-time telegrapher, now in another line of business.

Items of General Interest.

RATE OF INTEREST ON STOCK.—To find the rate of interest on stock when the stock is selling above or below par, divide the rate of interest on the par value by one per cent. of the market price of the stock, the quotient will be the rate of interest on the investment.

For example: A 6 per cent stock (par value $100) selling at 65 on the market, what is the interest on the investment?

$$\frac{6}{.65} = 9.23 + \text{ per cent.}$$

If a 6 per cent. stock is selling at 110, what is the interest on the investment?

$$\frac{6}{1.10} = 5.45 + \text{ per cent.}$$

Mounting Tinfoil on Glass Condenser Plates.

A good shellac for fastening the foil to the glass in transmitting condensers may be made by dissolving as much powdered rosin as possible in one ounce of turpentine and thinning the mixture by the addition of one-half ounce of alcohol. Only a very small amount of rosin will be needed.

About three drops of shellac should be put in the center of the surface of the glass and rubbed around well. Place the foil on the glass and roll it fast with a photographic print roller. The foil must be placed on at once, as the mixture dries quickly. When this varnish is used the plates may either be stacked or made into an open rack condenser. If plain turpentine is used the foil will not stick so well, and consequently the plates must always be stacked.

Mistress—Goodness, Bridget, where is our telephone?

Bridget—Mrs. Jones sent over, mum, askin' for the use av it and I sint it over, but I had the devil's own toime gittin' it off the wall, mum.—*Toledo Blade.*

Hope.

Great hopes make great men, and hopes are as cheap as despair. Hope and joy are the daughters of prosperity and despair leads to adversity. Hope holds up the head and is sweeter than possession. Without hope there is no incentive to work.

LETTERS FROM OUR AGENTS.

New York Western Union.

Chief Operator Palmer's office has been removed from the sixteenth to the twelfth floor of this building, where his department occupies a much larger space.

Everyone identified with the main office force is proud of the fact that the service flag at the present writing will contain 110 stars. One hundred and one men enlisted and nine were drafted. Every one of them is a star of the first magnitude, and will render an efficient service to the nation in the world's war.

Since election, business has slacked off a little, which affords an opportunity for many to take their vacations.

Great interest was manifested in this office by the entire force in making the entertainment of the New York Telegraphers' Aid Society for the benefit of the Relief Fund a great success. It is quite evident that their efforts were rewarded by the addition of a substantial sum to the Relief Fund.

The tube center has been rearranged so as to provide some additional space, which was badly needed to expedite the handling of the greatly increased traffic.

Warren Taylor, formerly an operator in this office, is now in command of Company A, 304th Field Signal Battalion, Camp Meade, Md.

Two of our student graduates were recently assigned to Mr. Tucker as telegraph operators for government service.

The first business meeting of the Western Union Educational Society was held on November 7, in this building, and the election of officers for the ensuing year resulted as follows: President, G. E. Palmer; first vice-president, T. B. Clark; second vice-president, Miss C. G. Eckstrand; secretary-treasurer, Frank A. Hoag; recording secretary, Miss L. M. Park. President Palmer will soon appoint some live committees to conduct lectures, entertainments and several contemplated new departures.

Mr. J. V. Riddick, of the Marine Department, is absent on vacation.

Entertainment of New York Telegraphers' Aid Society.

The annual entertainment and reception of the New York Telegraphers' Aid Society, for the benefit of the charity fund, was held in the Lexington Opera House and Terrace Garden, at Fifty-eighth Street and Third Avenue, Tuesday evening, November 13, and was largely attended by prominent telegraphers and others.

The early part of the evening was given over to an excellent vaudeville entertainment, after which the rest of the evening was passed in dancing, the affair altogether being of the most enjoyable kind.

Many of the executive officials of the Western Union Telegraph Company were in attendance, including Mr. Newcomb Carlton, president; J. F. Nathan, general commercial superintendent; S. B. Haig, general superintendent of traffic; A. D. Wetmore, of Boston; G. E. Palmer, chief operator; L. C. Boochever, traffic supervisor; E. F. Howell, secretary of the Serial Building Loan and Savings Institution and hundreds of others.

Mr. Carlton was taken in charge of by a committee headed by Mr. A. M. Lewis, president of the Society, and was introduced to a large number of those present. Mr. Carlton was in a happy frame of mind, greeted everyone cordially, and expressed himself as gratified to be present and meet so many telegraph people.

Mr. Thos. M. Brennan, treasurer of the society, with his daughter, Mary E., led the grand march.

There were fully 2,000 persons present and it was therefore the most representative telegraph gathering ever held in New York. The Postal Telegraph-Cable Company was also well represented, employes of each department being in attendance.

Mr. R. J. Marrin, chairman of the entertainment committee, performed his exacting duties on this occasion in a most satisfactory manner to all concerned, and to him the success of the affair is largely due. The other officers of the society are also entitled to much credit.

This annual entertainment is given for the benefit of the relief fund, which is an auxiliary fund maintained by the net proceeds of these entertainments, and is used for the immediate relief of worthy telegraphers who may be in distress, and who, because of infirmity or other causes, are ineligible for membership in the society.

Mr. A. M. Lewis is president of the society, Mr. C. A. Kilfoyle, financial secretary, and Mr. T. M. Brennan, treasurer, all of 24 Walker Street.

Philadelphia Postal.

Miss Emma Pauline Cullis, stenographer to Manager J. H. Wilson, was married on October 22 to Henry Parkerson Haney Crook, a prominent business man, of Chester, Pa. A handsome gift was presented by the office force and lots of good wishes were extended to the newlyweds, who are spending their honeymoon in Florida.

Among the new arrivals are Louis J. Rendelman, in the operating department, and Miss Mary E. Taber, clerk to Mr. J. H. Wilson, manager. J. J. Hardy, chief clerk to Superintendent C. E. Bagley, has returned from a rest at the seashore.

Vice-President Major Charles P. Bruch and Electrical Engineer D. H. Gage were among the recent visitors.

H. N. Budman, operator, has returned to duty after several weeks of illness.

The Board of Governors of the Dot and Dash Club of Philadelphia, at its meeting, decided to dispense with its fall dinner, because of the unusual conditions existing on account of the war. The club is composed of officials and employes of the commercial, railroad and brokerage telegraph systems and press associations of this city.

Pittsburgh Western Union.

The first meeting of the season of the Western Union Educational Society of Pittsburgh, Pa., was held on October 3. Officers for the ensuing year were elected as follows: President, J. A. Larimore (reëlected); vice-presidents, E. R. Collings, manager; P. F. Driscoll, wire chief; O. A. Huber, repeater attendant; secretary and treasurer, B. W. Jones, operating department.

Chicago Postal.

Charles A. Dortmund, of this office, and president of the Chicago Telegraphers' Aid Society, died on October 31. He was a faithful and efficient employe and rendered valuable service on behalf of the Aid Society. His death is deeply regretted.

The employes of the Chicago district of this company liberally subscribed to the second Liberty Loan, the amount totaling $100,000.

Chicago Western Union.

A son has arrived at the home of T. J. Drohan

David A. Weaver, an old-timer, and formerly employed in the Chicago main office of this company, died on November 1.

Helena Western Union.

This office is now under the direction of Earl E. Stanfield, chief operator, formerly wire chief of the Denver office. Mr. Stanfield makes a very efficient chief operator and is well liked by all. The staff is as follows: A Cullen, night chief; C. C. Carpenter, late night chief; B. Z. Kastler, wire chief; J. E. Steinback, assistant wire chief; G. O. McNerney, night wire chief; T. F. Barnett, automatic chief; Louis J. Malnatti, assistant to automatic chief; Owen Yerkes, night automatic chief; E. B. Oleson, late night multiplex attendant; W. K. Thompson, Morse supervisor; J. A. Davidson, automatic supervisor; Nell McGinnis, Flora Simpson, Edna Sweet, Emma Hammer, Elizabeth Rowley, assistant automatic supervisors. The commercial department is under the management of Mr. T. E. Sweetser.

President Newcomb Carlton, Lewis McKisick, assistant to the president, and vice-presidents J. C. Willever, of the commercial department and W. N. Fashbaugh of the traffic department, recently paid us a visit.

Books Worth Having

It frequently happens that young men starting their career as telegraph operators wish to know something about technical telegraphy and telephony. Their means are limited and they need accurate information to set them right. We would advise all such to purchase a copy of Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students, by Willis H. Jones; price $2.00. This is probably the best low priced book covering telegraph subjects on the market. An equally good low priced book on the telephone is Radcliff and Cushing's Telephone Construction, Installation, Wiring, Operation and Maintenance; price $1.00, or Homan's First Principles of Electricity, price $1.00. These books will ground a student in the principles of the telegraph and telephone if they are read repeatedly until the student becomes as familiar with the subjects treated as are the authors of the books themselves.

Copies of these books or any other on the market can be obtained by addressing J. B. Taltavall, publisher, TELEGRAPH AND TELEGRAPH AGE, 253 Broadway, New York.

KNOCKED OUT BY HIGH HEELS.—The government may have to establish a fashion administration. The telegraph companies were beginning to exult because the messenger problem seemed to be solved by the employment of girls, but now a new enemy has appeared. In some places the girls have had to give up the messenger idea on account of the high heels on their shoes.

BECOME A MASTER OF ELECTRICITY

This busy world needs practical men, not theorists. The men occupying the highest and most influential positions in business today are truly practical men.

Young men who learn the electrical trades in the school of practice have an infinitely better chance of acquiring fame and honor than the one who drifts along without any aim.

The New York Electrical School fits men to become masters in the electrical trade, and the instruction and knowledge thus acquired leads them to higher ambitions. The way to learn the electrical trades is by doing the actual work systematically, and this is the method followed by the New York Electrical School.

Send for printed matter telling how the work is carried on. You will become interested.

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Saturdays 1 p. m.

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BACK NUMBERS of this journal three or more months old will be charged for at the rate of 25 cents per copy. Issues over one year old, 50 cents for one copy, but where two or more copies are purchased, the price will be 25 cents per copy.

NEW YORK, DECEMBER 1, 1917.

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High-Speed Telegraph System Born in One Night.

Telegraph engineers who have spent and are spending many weary hours and much midnight oil in an endeavor to improve telegraph apparatus will blush for shame at their own shortsightedness when they learn that a Mr. Lambert of Salt Lake City, Utah, invented "on the spur of the moment" an instrument that can transmit 6,000 words per minute. Mr. Lambert's inspiration came when, at a banquet, he heard a representative of the government declare the great need for operators. He forthwith went to his laboratory and produced, that same night, an instrument that will do the work of 200 "ordinary telegraph wires," and will be able to manufacture them at the incredibily low cost of $50 per instrument.

It is declared the instrument does not interfere with the present use of telegraph lines, and can be operated after an hour's practice. The apparatus already is manufactured and needs only assembling, it is announced, and, if used commercially, will release hundreds of operators for the war.

The telegraph companies will no doubt be very glad to discern the faint glimmer of light through the dark outlook caused by the diminution of their operating forces, and the question of new plants need not worry them further because they will not need any. Mr. Lambert is truly the man of the hour.

The Importance of Thinking.

A short time ago an operator was taken to task by his superior for failing to act at the proper time.

"I didn't think," he said.

"You should have thought; what are your brains for?" rejoined the chief.

The cause of this remark was trivial in its nature, but the failure of the man to do the right thing at the right moment, when it was an easy matter to have done so, caused considerable annoyance.

Back of this little incident lies an important principle that most of us fail to heed at times. We are not alert and ready when thought and action are demanded.

One of the greatest weaknesses of many people is to make excuses, and the making of excuses means neglect of duty, or failure to think and act when called upon to do so.

The old saying that "he who excuses himself accuses himself" is as true today as ever, and is particularly apt in these days of business efficiency, when right thinking is demanded. Of course no one can be infallible in his decisions and judgments, but we can be awake and on the watch for errors of thought and action that constantly beset us. It is such an easy matter to fall into error, but it is quite as easy to avoid it if we keep our wits about us.

Failure to think leads us into many difficulties and pitfalls which we might have avoided by using our brains. Some men are too mentally lazy to think, but he who is wide awake derives much more happiness from life, and is always more successful than the man who does not think.

Electrical Apparatus and Appliances.

Let the old fogy who still thinks that the world is not progressing, after all, and that our forefathers were just as well off as we are today, reflect a moment on what electricity has done for mankind since the invention of the telegraph in 1832. The aforesaid old fogy has many descendants and we meet them now and then.

It would be quite impossible to enumerate all of the advantages and conveniences that electricity has wrought for the benefit of mankind. Beginning with the telegraph, we have the electric light, the telephone, the electric railway, transmission of power by electricity, wireless, electro-therapeutics, X-rays, etc., to say nothing of the almost endless list of smaller electrical appliances, such as washing machines, curling irons, percolators, heaters, cooking utensils, etc.

In these days of rapid progress few people realize what a place electricity holds in our lives. It is so common that we seldom think of it, but it is hardly more than a generation ago that the wonderful works accomplished by the aid of electricity were unknown. People got along in those early days, and they were evidently contented, as they moved slowly, but their successors have obtained a taste of what real progress is, and they want more and more of it. "Do it by electricity" is the slogan of today, and we are doing it.

Stock Quotations

Following are the New York closing quotations of telegraph and telephone stocks on November 26:

American Tel. and Tel. Co.	107¾
Mackay Companies	79¾
Mackay Companies, pfd.	65
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	2¾
Western Union	83

An Opportunity for Investment.

The present low prices of stocks offer extraordinary opportunities for investment. This publication is prepared to purchase for its friends one or more shares of Western Union, Mackay, Marconi or any other stocks, either outright or on the instalment plan. Remit $25.00 per share as the initial payment if purchase is to be made on the instalment plan. The stock will then be bought at the market price and the balance due on the stock can be paid off in any sum convenient to the purchaser. In the meantime 6 per cent interest will be charged for the balance due on the stock. The purchaser, however, will have the benefit of the dividends, which, in many cases, will more than pay the interest charges. As soon as the stock is paid for, it will be registered in the purchaser's name and delivered to him. The commission charge on the purchase of stock is $1.00 on transactions covering from one to eight shares. For eight or more shares the commission charge is 12½ cents per share. In remitting to cover purchases of stock, name the price at which purchases are to be made.

Telegraph and Telephone Patents.

ISSUED OCTOBER 30.

1,244,477. Telegraphy. To P. B. Delany, New York.

1,244,488. Telephone Exchange System. To C. L. Goodrum, New York.

1,244,571. Telephone Exchange System. To J. L. Wright, Cleveland, Ohio.

1,244,697. Wireless Receiving System. To J. R. Carson, New York.

1,244,816. Measured Service Telephone System. To B. D. Willis, Chicago, Ill.

1,244,990. Telephone Exchange System. To A. E. Lundell, New York.

ISSUED NOVEMBER 6.

1,245,166. Method of Transmitting and Receiving High-Frequency Signal Impulses. To F. K. Vreeland, New York.

1,245,266 and 1,245,267. Radiotelegraphy and Telephone Receiver. To G. W. Pickard, Boston, Mass.

1,245,341. Service Observing System. To H. L. Hoffman, Boston, Mass.

1,245,402. System for Observing Telephone Service. To J. F. Toomey, New York.

1,245,417. Electric Signaling System. To E. W. Adams, New York.

1,245,436. Automatic Telephone System. To E. H. Clark, New York.

1,245,894. Telegraphic Receiving System. To H. P. Clausen, New York.

1,245,466. Radiotelegraphy. To C. R. England, New York.

1,245,478. Telephone Exchange System. To A. E. Lundell, New York.

1,245,481. Selector Switch. To M. K. McGrath, New York.

1,245,490. Telephone Service Observing System. To E. C. Molina, New York.

PERSONAL.

MR. G. R. SCHULTZ, formerly manager of the Western Union Cable office at Punta Rassa, Fla., now retired, is visiting New York. He will return to his Fort Meyer, Fla., home early in December.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

MR. EDWARD REYNOLDS, vice-president and general manager, New York, was in Washington, D. C., last week on company business.

Death of E. Cuthbert Platt.

Advices received on November 14 announced the death in action, on the western front in France, on November 7, of E. Cuthbert Platt, eldest son of Edward C. Platt, treasurer and one of the executive officers of the Commercial Cable Company and the Postal Telegraph-Cable Company and of the Mackay Companies since their organization. He was a lieutenant in the Twenty-fourth Canadian Battalion, British Expeditionary Force. He was rejected by the British authorities in England because of his American citizenship. He returned to the United States, crossed the border to Canada, and enlisted there. He was a graduate of Princeton University. Lieutenant Platt was connected with the Western Electric Company in London.

MR. DONALD MCNICOL, of the electrical engineering staff, New York, has returned from Boston, where he went on company business.

MR. J. P. O'DONOHUE, division electrical engineer, New York, visited the Pittsburgh, Pa., office recently in connection with the pneumatic tube service.

MR. D. G. MCINTOSH, for many years manager of the Minneapolis, Minn., office of The North American Telegraph Company, has retired on account of ill health, his successor being Mr. J. R

Brown, formerly manager on 'change. Mr. Hugo Schroeck has succeeded Mr. Brown as manager of the 'change office.

MANAGERS APPOINTED: J. H. Fisher, Alexandria, Va.; E. A. Sinclair, Kosciusko, Miss.; R. S. Peace, Anniston, Ala., and Miss T. Fehrman, Waukegan, Ill.

FRANK W. SAMUELS, aged sixty-three years, a well-known newspaper and telegraph man of Indianapolis, Ind., died in that city November 13. Mr. Samuels was manager of the Indianapolis office of the Postal Telegraph-Cable Company for over twenty-two years, and worked latterly for outside interests.

NORMAN H. PERRIN, a member of the broker firm of Perrin and Massey, and an old-time Chicago local official, died on November 20. Mr. Perrin was manager of the Board of Trade office for this company for many years, and held other important positions in the service.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

MR. M. T. COOK, general manager, Pacific Division, San Francisco, Cal., was a recent New York visitor on company business.

MR. W. L. JACOBY, president, Controlled Companies of American District Telegraph Company, New York, has returned from an inspection trip to Pacific Coast points. Mr. C. P. Pollock, general superintendent of the Eastern Division, with headquarters in New York, is on an inspection trip through his division.

MR. PORTER E. RAMSEY, who was recently appointed district plant superintendent of the fifth and sixth districts, Southern Division, will make Richmond, Va., his headquarters.

MR. J. B. FAULKNER, plant superintendent at Richmond, Va., has been transferred to the staff of Mr. L. H. Beck, division plant superintendent, Atlanta, Ga., where he will be engaged on special problems in connection with equipment work.

MESSRS. L. M. ROBB and R. T. Friebus, of the plant engineer's department, have been commissioned first lieutenant, Aviation Department, Signal Corps, and second lieutenant, Ordnance Department, respectively, and have left to take up their new duties.

MR. O. J. NOURSE, of vice-president Fashbaugh's office, is in Montreal instructing the Great North Western staff at that point in the management and operation of the multiplex sytem.

NEW YORK BUSINESS VISITORS.—Among recent business visitors at headquarters were T. H. Haston, traffic supervisor, Chicago; L. J. Amsden, chief clerk to General Manager H. C. Worthen, Atlanta, Ga.

MR. G. E. WOODS, chief operator at Charlotte, N. C., has been appointed division traffic supervisor at Atlanta, Ga. He is succeeded as chief operator at Charlotte by H. J. Hale.

NEW OFFICE IN TACOMA.—Quarters for a new office in Tacoma, Wash., are now being fitted out, and it is expected that possession will be taken by the first of the year.

A. J. Campbell, Chief Operator, Montgomery, Ala.

Mr. Alton Jay Campbell, recently appointed chief operator of the Western Union Telegraph Company at Montgomery, Ala., was born at Ashland, Ky., February 7, 1888, and began his telegraph service as messenger in his home town in 1900. He became clerk and afterwards an operator and worked in various places in Kentucky, West Virginia and Ohio. He became repeater attendant, night chief operator, wire chief and finally chief operator at Ashland. He has held positions at Cincinnati, Ohio, and Roanoke and Richmond, Va., and was transferred to Montgomery, Ala., July 23, 1914, as night chief operator, from which position he was recently advanced.

THE CABLE.

MR. J. J. WELCH, assistant traffic manager for America, Western Union Telegraph Company, is on a trip of inspection to the cable stations in Newfoundland.

MR. T. E. FOLEY, superintendent of the Western Union cable station at Hammels, L. I., and Mr. R. O. Jones of vice-president Fashbaugh's office, New York, are at the North Sydney, N. S., cable station instructing the staff at that point in the management and operation of the multiplex system recently installed there.

CABLE LANDINGS CHANGED.—The transference of the Eastern Extension Company's cables ending at La Perouse, N. S. W., and Wakapuaka, N. Z., respectively, to Sydney and Wellington established direct communication between Wellington and Sydney, thus avoiding two repetitions of messages en route.

NEW BRAZILIAN CABLES.—A concession has been granted to the Western Telegraph Company, whose headquarters are in London, for a cable connecting Rio de Janeiro with the Isle of Ascension and for another cable joining Belem-Para, in the north of Brazil, with Barbados. The construction of these cables will greatly facilitate telegraphic communication between South America and the rest of the world.—London *Electrical Review.*

Alexander Davidson, General Manager Central and South American Cable System.

Mr. Alexander Davidson has been appointed general manager of the Mexican Telegraph Company and Central and South American Telegraph Company, with headquarters in New York. Mr. Davidson has for many years been the Central and South American Telegraph Company's electrician and superintendent, stationed at Lima, Peru. He is not only personally known to all the staff of the Mexican and Central and South American telegraph companies, but also to the officers and staffs of the Atlantic cable companies.

Mr. Davidson entered the British Government telegraph service at the age of sixteen. After studying for four years at the Royal Technical College, Glasgow, winning the silver medal of the City and Guilds of London Institute and the bronze medal of the Royal College of Science, Kensington, England, he was recommended by his professors to the Anglo-American Telegraph Company for service as junior electrician on the cable steamer "Minia."

Three years of service, under the late Captain Trott, on the deep sea cable repairing expeditions in the Atlantic followed. These expeditions included the final attempts to repair the 1869 French Atlantic Brest-St. Pierre cable.

After a year with the Commercial Cable Company in New York, he was selected in 1896 by President Scrymser of the Central and South American Telegraph Company, for service on his South American cable system. Since then Mr. Davidson has been continuously employed on the maintenance of these cable communications, which have contributed so effectively and powerfully to the development of South American natural resources and trade relations with the United States.

P. J. Tierney, Cable Censor, New York.

The subject of this sketch, Patrick James Tierney, was born in New York City, January 18, 1856. He entered the Western Union Telegraph Company's service at 145 Broadway, New York, as messenger, in 1870, and was soon assigned to the operating department as clerk. He was appointed operator March 10, 1871. On October 15, 1873, he was transferred to the Western Union, Omaha, Neb., office, and on July 1, 1874, to the Western Union, Chicago. In November, 1875, Mr. Tierney entered the Atlantic and Pacific service in New York, and was transferred to Buffalo April 1, 1876. On July 1, 1876, he returned to the Western Union in New York, since which date all his activities have been centered in New York, the greater part of the time in the financial district with the Western Union Company's cable service.

P. J. TIERNEY.

On May 1 this year Mr. Tierney was ordered into the active service of the United States Naval Reserve force and assigned to Commander Hoff's division, handling the cable censorship work.

Mr. Tierney's son, Raymond L. Tierney, is also in the active service of the government as a corporal of the Ninth Company, Thirteenth Coast Defense Command, at present guarding the entrance to the harbor of New York.

CANADIAN NOTES.

Mr. H. Hulatt, manager of telegraphs, Grand Trunk Pacific Telegraph Company, Montreal, Que., announces the appointment of R. M. Macmillan as acting division superintendent of telegraphs (lines in Ontario, Manitoba and Saskatchewan), also acting superintendent of time service of that company, with headquarters at Winnipeg, Man., vice Mr. F. T. Caldwell, who has been granted leave of absence consequent on entering the military service.

THE TELEPHONE.

Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company, has accepted the chairmanship of the Red Cross Christmas membership committee. The object of the Christmas "drive" is to increase the Red Cross membership to 15,000,000, the roll now listing about 5,000,000 names.

Mr. H. Blair Smith has been appointed acting comptroller of the American Telephone and Telegraph Company in the absence of Mr. C. G. Du Bois, who is engaged in the Red Cross service in Washington. Mr. E. V. Cox has been appointed general auditor of the same company.

Mr. E. F. Carter has been appointed general manager of the Southwestern Bell Telephone Company (Missouri) for the state of Texas.

Mr. J. E. Boisseau, of the Chesapeake and Potomac Telephone Company, Baltimore, Md., has been appointed acting general commercial superintendent, in the absence of Mr. S. M. Greer, who is on Red Cross service.

New Telephone Directories.—The New York Telephone Company's directory, just issued, contains approximately 425,000 names of telephone subscribers, 25,000 more than were in the 1916 winter issue. Approximately 730,000 copies will be distributed. There are eighty-seven central office designations for New York City's 700,000 telephones. The telephone company is also distributing new directories in New Jersey, Long Island, and Rockland and Westchester counties. More than 1,000,000 books will be distributed.

Independent Telephone Convention Definitely Postponed.

It has been definitely decided to postpone the annual convention of the United States Independent Telephone Association from December 11-14 until June 25-28, 1918. The convention will be held in Chicago.

Report of Atlanta Convention of Telephone Pioneers of America.

The Telephone Pioneers of America have just issued the bound proceedings of the sixth annual convention, which was held at Atlanta, Ga., October 26-28, 1916. The book has 134 pages, and contains a copy of the constitution and by-laws; roster of the Telephone Pioneers of America; full proceedings of the Atlanta meeting; addresses of L. B. McFarlane, F. H. Bethell, C. E. Scribner and F. A. Pickernell, and other matters of interest. Besides these it contains illustrations of Theo. N. Vail (president), W. T. Gentry, J. Epps Brown, R. H. Starrett (secretary), G. D. Milne, L. B. McFarlane, F. H. Bethell, C. E. Scribner and F. A. Pickernell, and general views of points of interest in and about Atlanta and other places along the "trail."

The book is gotten up in the usual high standard style of the Pioneers' publications, and Secretary Starrett is entitled to much credit for the results of his editorial labors.

News Distribution by Telephone.

Developments in the telephone field, as well as in the telegraph, are so rapid that it is hardly possible for one man to keep track of them. The use of the telephone in the distribution of news is little known outside of the newspaper field, not that there is any secrecy connected with it, but because it has come into existence through an easy development and is taken as a matter of course.

Compared with the telegraph, the telephone method of handling news matter is much more rapid. Any amount of matter can be handled with ease, and the increased speed is secured without the sacrifice of accuracy. The work is performed by any member of the newspaper staff.

The telephone provides a most efficient means for the quick handling of newspaper reports or "specials." Before the advent of the telephone in the dissemination of news, it was the practice of the press associations to file copies of the specials with the telegraph companies. These specials would be transmitted over the latter's commercial wires and delivered to the newspaper by messenger. The modern method of handling this class of service is to talk the report from the press bureau direct to the newspaper with practically no loss of time. This method enables the paper to receive the last-minute news right up to the moment of going to press.

Telephone press service has been developed to such an extent that a number of newspapers located in widely separated towns are supplied with news from a central point at the same time. A circuit is made up reaching the desired points, and the man at the press bureau or newspaper reads the report to all of them at the same time. This circuit arrangement, which, in effect, is a private wire for the time being, also permits an exchange of news between the various papers connected.

Compared with the telegraph, the telephone provides the individual newspaper or press association with a more rapid and extremely flexible means of collecting news. It also provides an almost limitless field for the collection of news. With the telephone accessible everywhere, and instantly available, it enables the newspaper to have correspondents in every town. A newspaper correspondent in the field having occasion to report an important happening, instead of stopping to write up an account immediately, puts in a telephone call for his paper, and, on getting the office, tells the story to the editor in his own way and in a few words. The editor then writes up the story in full detail. This effects a saving in both time and tolls and gives the editor a means of choking off stories of no importance, or those which, for other reasons, cannot be used that day.

A further refinement of the use of the telephone in newspaper work, and which opens a large field for future development, is in the transmission of news matter over a toll line direct to a linotype operator in the composing room. Practical demonstrations over long circuits show the perfect feasibility of handling news in this manner, eliminating the use of "copy" by the linotype operator, and effecting a further saving of time. The speed of transmission in this case is governed not by the ability of the linotype operator, but by the mechanical limitations of the linotype machine. However, a speed of from fifty to sixty words a minute can be obtained, which is better than that of a fast Morse wire with the use of code and typewriter.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. David Sarnoff, commercial manager, New York, was in Washington two days last week in conference with officials of the Navy Department.

Messrs. P. C. Ringgold, R. F. Miller, L. B. Stewart and L. B. Taufembach, of the executive offices, have enrolled in the navy as chief petty officers and will shortly take up their new duties.

Mr. W. W. Ward, who has been for three years station manager at Belmar, N. J., has entered the service of the navy as superintendent of plant and grounds at that station.

Mr. M. E. Albee, engineer in charge, and Mr. Arthur Smalley, chief rigger at the New Brunswick, N. J., station, have enrolled in the navy and will remain at that point.

WIRELESS TELEGRAPHY ON ZEPPELINS.—A French officer who examined the Zeppelin that was brought down intact at Bourbonnes les Bains recently states that the fleet of which it formed a part came to grief partly owing to the breakdown of its wireless apparatus, due to the extreme cold at the high altitudes attained. There was also a failure on the part of the wireless stations on land from which the Zeppelins got information as to their position by code messages. Owing to the number of airships which lost their bearings, the land stations got confused, and their answers to questions asked of them were unintelligible.

OBITUARY.

P. WALTER STAYLOR, aged forty-six years, an operator for a banking firm in Baltimore, Md., died suddenly, November 11.

FREDERICK W. COLE, aged sixty years, for many years consulting engineer of the Gamewell Fire Alarm Telegraph Company, Boston, Mass., and inventor of many of the devices used in the company's system, died at Newton Highlands, Mass., November 11.

Wireless in the War.*

BY GUGLIELMO MARCONI.

The most striking features of my observations since I have been on this official visit to the United States is the surprising ignorance of your wireless men concerning the conditions in the fighting zone abroad. It has required a readjustment of viewpoint for me to appreciate the fact that so much of the scientific development of the wireless art has been kept secret for military reasons; naturally the United States cannot know of things which to us have seemingly become elementary.

For example, it appears that American wireless men still look upon a portable set as a novelty, whereas on the western front, and particularly in the trenches, portable sets of all types have become indispensable. They vary in appearance from carefully designed equipments in neat containers to a key, coil and crudely manufactured accessories, strapped to a board. There has been no attempt at standardization—we have not had time.

A second impression, very general among Americans, is that wireless has not been a great factor in the war. In various quarters I have heard it said that you understood wireless was tried in the early months of the fighting and, being found impractical, was virtually abandoned so far as the army is concerned. Nothing could be further from the truth. To illustrate its great importance in modern warfare, I have only to say that, with the exception of the first two or three months of the war, wireless has furnished the sole means of communication in the first line of trenches.

No longer are wired telephones and telegraphs used in the trenches bordering No Man's Land. We found it impossible to maintain these lines with the constant shelling by high explosives. When you go into a first line trench today you will find very little else occupying it but the wireless men. These trenches are not filled up with infantry at all times, as the popular conception has it. Unless an engagement is in progress there will be found only a handful of fighting men with machine guns, distributed in small detachments about every 400 yards, and supported by the ever-present wireless man with his portable set. Through the continued and heavy shelling it is not possible to maintain many troops in these trenches, so, until an advance of enemy infantry is observed, the wireless man and a few infantrymen to protect him are in sole possession. With the first observation of an infantry attack, the wireless man gets in action and sends back his call for troops from the supporting trenches. They pour in then through a traverse and the hand-to-hand engagement begins.

What I have said may convey the impression that there is no such person as a wire operator at the front. On the contrary, there are a great many—as many, I should say, as there are wireless operators, but certainly not more. Their duties are a little different. They maintain the very important telephone and telegraph communications between the supporting trenches and the field bases, and keep in operation a network of connecting lines directly back of the fighting zone. There is a constant need for signalmen, and, the American development of amateur experimenting having been so extensive, I look to the wireless men to make a great record in this war.

So pressing has been the need for operators, we have taught some of our men transmitting only, and assigned them to duties where a knowledge of receiving is not essential. It is of course obvious, however, that a man who can both send and receive is far better equipped for duties where the lives of thousands of human beings are involved.

Now, in the consideration of wireless as applied to air service, I have a subject which caused me greater surprise than anything I have learned here as to American misconception of what has been done. The general supposition seems to have been that spotting of artillery fire has been accomplished through the use of various forms of visual signaling, such as flags and smoke bombs dropped from a 'plane. The truth of the matter is that our entire heavy artillery fire control is conducted by wireless from aircraft. At the very outset of the war we had neither equipment, experience nor personnel to accomplish this, so it was our custom to send up an observer with the airplane pilot, who carefully drew a picture of the enemy battery emplacements, flew back to his own lines and dropped these drawings. This is no longer done. The observer now notes the results of his artillery fire and sends back by wireless such messages as "too short," "three to right," "two to left," and so on.

The reconnaissance machines are protected by fighting 'planes, which fly in squadrons over enemy lines, attacking every enemy machine they encounter, and thus allowing the observers to complete their work undisturbed. It is such an ordinary sight to see these airplanes at all hours of the day that their presence means nothing special to us. They are merely part of the great fighting machine which we have builded up. Their observations continue all day long, and are of incalculable value. Many of the airplanes now in use show amazing development in power, speed and carrying capacity. We have quite a number of 'planes which carry as many as six or eight men, armed with machine guns.

The wireless operator who makes the observations for fire control is provided with a map of the terrain blocked off into small squares. As he spots the fall of the shells, he sends back by wireless the number of the square and records a hit or gives directions for greater accuracy. While he is spotting he is continually subjected to tremendous shelling—white puffs of smoke break around the reconnaissance 'planes all day long—but it is surprisingly seldom that they are hit.

The demand for wireless operators is best illustrated by saying that at least half of the signalmen are wireless operators. The communication service is about equally divided between wire and wireless.

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*Abstract from *Wireless Age.*

Every telegraph and telephone man should keep closely informed as to what is going on in these fields. Subscribe for TELEGRAPH AND TELEPHONE AGE.

Intercommunication, Commerce and Civilization.

At the opening of the new Chamber of Commerce Building, in Rochester, N. Y., October 3, Mr. Theo. N. Vail, president of the American Telephone and Telegraph Company, made an address on Intercommunication, Commerce and Civilization.

The portion of the address relating to the telegraph and the telephone forms an interesting chapter, and we publish it herewith.

Speaking of S. F. B. Morse, Mr. Vail said:

Neglecting his profession, struggling with poverty, his ideas rejected by his friends and those he tried to impress, he maintained his faith; his courage never failed. Morse was neither a capitalist, an electrician, nor a mechanic, and to develop his idea these were essentials. It was not until he formed a partnership with Alfred Vail, of Speedwell, near Morristown, N. J., in whom he found an educated scientist, a practical mechanic of an inventive turn of mind, with a capitalist and a manufacturer of advanced ideas for a father, that the opportunity became full fledged and completely manned. There has been some discussion, sometimes verging on acrimonious dispute, as to how much credit was due to each, but it would seem as if there was enough for both, and the individual peculiarities of each of the partners would indicate just what each was entitled to. But one thing must be remembered: that no invention, however meritorious, ever pushed itself, and we must recognize that to Morse's indefatigable persistency and intense and impressive personality the early progress of this new and advanced factor of progress was due.

It was at the Speedwell ironworks, owned by Judge Vail, Mr. Vail continued, that the engines of the first steamship which crossed the Atlantic were built, and among the first locomotives used in this country were those built by the firm of Baldwin & Vail, the predecessors of the present great industrial establishment, the Baldwin Locomotive Works.

These incidents are related to show that the capital furnished Morse was not from any speculative promoter, but from one who had experience in and was a believer in the advancement and extension of intercommunication.

An interesting story is told about the experiments on the telegraph at Speedwell. In a building apart from the main works, Morse and Vail were working alone, with the usual discouragements and without marked result. Time was passing and the allotted money was going. The Judge was beginning to doubt the outcome, and both the young men avoided meeting him whenever possible, fearing his questioning.

At last success was achieved; the signals were successfully transmitted; the Judge was asked to visit the experiment shop. He listened to the explanation, but wanted a demonstration. Writing upon a slip of paper "A patient waiter is no loser," folding it and giving it to one of them, with the other he went to the room in which was the other end of the line. It came over the wire as written. This was the first telegraph message that was ever transmitted. The rest of the development is history.

The existing facilities for intercourse, intercommunication, transportation had done a great work. The necessity existed and the field had been made for quicker, more personal communication between far apart places. Electrical transmission put the flare, the materiality, of personal intercourse into negotiations between distantly separated parties. Never had the opportunity and the thing required come together so opportunely.

The introduction of the new invention into commercial use was through separate and unconnected enterprises. Independent lines were built by independent associations, each connecting a few of the important cities. Through routes and through circuits were unknown. Frequent relays and transfers caused delay, retarded transmission, and the possibilities that should attend this method of communication were far from being realized.

This was recognized by a few men, foremost among whom were citizens of your town, under the lead of one who became the greatest promoter of the new birth of this new industry, Mr. Hiram Sibley.

Here in Rochester was born the Western Union Telegraph Company, which combined the scattered struggling enterprises which followed the first introduction and molded them into one efficient whole. Here was organized and from here radiated the greatest telegraph system the world has ever known or will ever know.

The organization of the Western Union had more than a passing significance; its founders builded bigger than they knew. It was the first application, if not the first recognition, of that great principle which underlies model efficiency in utilities and in industries, particularly those of transportation and transmission. It was the beginning of those great combinations which, economically sound, have contributed so much to the prosperity of our country. The action of your citizens met with countrywide approval and was received with countrywide enthusiasm.

In the organization and operation of the Western Union was first recognized and introduced the idea of "through connections," "through routes." It was the beginning of continuous service from origin to destination. This sounds simple, but it is the great principle upon which all freight, express, through passenger and sleeping-car service is based today. It was the first combination, into an operative whole under one control, of a number of separated entities, whose separate services combined constitute a complete service. These "principles" constitute the greatest factors in the world's progress in economic development and are the principles which stupidity, prejudice and ignorance, backed by political demagogism, is trying to destroy today.

In the development of the telegraph came many experiments for its multiplication, and in the course of them it was found that musical notes could be transmitted by electricity. If musical notes, why not vocal sounds? There is a marked difference between the vibration of a musical tone and of a vocal sound. To solve the problem a knowledge of acoustics was necessary, and was introduced by a young Harvard professor who was experimenting in harmonic electrical transmission. Within a quarter of a century after the first practical electrical transmission of intelligence was also developed the transmission of the spoken voice by Professor Bell's discoveries and inventions. The evolution of this is well known to you all, too recent for historical narrative, and my connection with it too intimate for me to be the historian.

To one who has covered the period from the first introduction of electricity to its operations at the present day, who by personal recollection and experience knows of what was then and what is now, all seems like a romance. One who knows only the present cannot realize what has been done—what changes have been brought about by the introduction of personal intercourse between distant points and the neighboring of all the people of all the world. We do not yet fully comprehend what is and will be its influence on the conditions of life, the character and habits of people.

Neither the exchange of ideas or intelligence by means of personal communication electrically transmitted, nor the bringing of people physically remote into mental contact by means of the transmission of the spoken voice has by far reached its ultimate usefulness and development of all the potentialities of wire service. Although the telegraph and the telephone, which are not competitors with each other, but natural complements to each other, are forced to maintain a separate service and operate as though they gave the same service and served the same purpose, there are still great possibilities ahead. If, however, the natural and inevitable principles which should govern all service of all kinds are allowed their natural course, and these two utilities, which have been recently divorced, should again be united, there are possibilities of improvements in service and potentialities for new service which for benefit and advantage in every direction are so far beyond anything the public is now getting, and will include such great economies, that the present service, great as it is, will seem crude and costly in comparison.

Telegraph and Telephone Lines Across the Great Salt Lake Desert.

The Great Salt Lake Desert is an old lake bottom, and consists of a large, deep valley filled with mud to a known depth of over four hundred feet and probably many hundreds of feet deeper than this, says C. C. Pratt in *The Mountain States Monitor*.

A drill hole put down by a chemical company at a spot where the surface is covered by an immense bed of salt went through eight feet of solid salt, two hundred feet of mud, thirty feet of solid salt and another two hundred feet of mud, at which point the drilling was stopped.

The surface salt bed is about eight miles wide by twenty-five miles long, varying in depth from a few inches to eight feet.

The mud is covered by a crust which, in the dry season, will carry the weight of a horse or a tractor, but if a hole is broken through it rapidly fills with salt water and the mud becomes softer with depth.

The rain and melted snow from the surrounding mountains runs into this flat lake bottom and is blown for miles by the wind. Often there will be several inches of water in a given section one day and none the following day, due to the wind having blown it many miles away during the night.

The Western Pacific Railroad and the lines of the telegraph companies and the transcontinental telephone lines all cross this desert, and the problems of construction and maintenance encountered by these companies are interesting.

The railroad company laid a flooring of planks on the mud and built its gravel roadbed on this, and since has filled in with rock in some places to protect the roadbed from the action of the drifting waters.

The telegraph and telephone companies use special side guys to keep the pole lines upright in the mud, and, due to the fact that this mud is impregnated with salt, which preserves the wood from the usual forms of rot, these pole lines will last many times as long as usual.

But, due to the large amount of salt blown about by the wind, the glass insulators become covered with a fine coating which destroys their insulating qualities, making it necessary every few years to wash the insulators.

The telegraph companies do this by taking the insulators down, washing them just as dishes are ordinarily washed, but the cost of this method is high, and the lines are weakened mechanically by the untying and tying in of wires. The telephone company therefore used a method which overcame these faults. The washing was done by playing a jet of saturated steam upon each insulator for several minutes. This sounds very simple, but the job was accomplished with much difficulty.

This section of line washed crosses eight miles of solid salt and thirty-four miles of mud flats over which no highways have ever been built.

The steam generating plant, mounted on a light automobile frame with wide metal tires, was pulled across the section by a Ford car, also equipped with wide tires.

Several miles of mud, however, were so soft it was necessary to lay planks to keep the car and steam generator from sinking.

As the wash progressed the daily insulation tests showed an improvement in the insulation, proving that the steam-cleaner idea was accomplishing the desired results.

Last winter about one and one-half miles of pole line on the desert were pushed several feet out of line, the butts being badly "chewed up" by floating ice.

Our reputation for wisdom depends upon our success.—*Euripides.*

Who Is Our Best Employer?

BY THALIA NEWTON BROWN, MARCONI WIRELESS TELEGRAPH COMPANY OF AMERICA, NEW YORK.

[We are glad to reprint the following from *Forbes Magazine.* Mr. Nally is well known to readers of TELEGRAPH AND TELEPHONE AGE, having been a conspicuous figure in telegraph circles for more than a quarter of a century, and it is interesting to note the high regard in which he is held by one who has been closely associated with him for so many years.—Editor.]

Having had but two employers in a business experience beginning in 1891, my opinion is not based on a knowledge of the qualifications of many, but rather on a long experience with these two. The fact that my present employment has continued since 1896 is proof of the ideal conditions under which the work is performed.

My first employer was the law firm of Wallace, Billingsley & Tayler, in a small Ohio town. To them I feel indebted for a splendid grounding in "accuracy first"—not then a business slogan, as it is now, but a firmly established principle with them, and insisted upon in their employes. Nothing that was not accurate was permitted to leave the office. No letter containing errors in spelling or typing could go to a client; no legal document could be filed in the nearby courthouse that was not correct in form and phrasing. Erasures and corrections were not permitted in legal documents, and in letters only when they were not discernible. All letters were written with copying ribbon, and if, in making the copy book impression, they were smeared or not clean cut, the work must be done over.

With all of the exacting requirements as to services rendered, each member of the firm was the personification of kindliness and thoughtfulness in his treatment, and when I left their service to join members of my family in Chicago I felt that never again would I find such an ideal place of employment.

But I am now rounding out my twenty-second year of service for my present employer, the vice-president and general manager of the Marconi Wireless Telegraph Company of America, Edward J. Nally, a man equally exacting in his requirements, and equally kind and thoughtful.

Calling on him with a letter of introduction, I fortunately happened in at a time when there was an unusual rush of work and one of the stenographers absent for the day. I was put to work at her desk and on her return the following day was transferred to other duties. The pressure of work was tremendous, and I was quickly convinced that without the exacting training of my previous four years I could never have met the demand.

EDWARD J. NALLY.

I soon learned that what my employer most desired from employes, after loyal and conscientious application to the task assigned, was initiative, and a willingness to do a little more than was actually required. He was always ready to receive suggestions, and to act on them, never rejecting them without good reason, and, when adopted, giving the employe full credit therefor.

He demanded from all the force a full day's work for a full day's pay, and was strongly averse to nightwork or overtime, holding that one could produce the best results only within the prescribed working hours and having the remainder of the day for rest and recreation. It was a rare exception that anyone was permitted to remain after hours to complete a task that should have been finished in the time assigned to it. All of which resulted in a hard working and interested force, who knew that their time was their own after the closing hour, and that if any task remained undone extra effort must be expended the next day to complete it and the work the day brought with it. Not only did he demand this of his force, but he applied the rule equally to himself, and only at rare intervals have I known him to leave his desk at night with anything undone.

My first promotion—to the position of cashier, with the responsibility for many thousands of dollars and a monthly report to the head office—came near to being my Waterloo. My employer and the bond company evidently had faith in my honesty, and, as I was "next in line" for the position, I was encouraged to struggle on until I mastered the intricacies of the forms of accounting and of the twelve-page detailed cash report.

The story of my struggle would make another chapter, and has no part in this narrative, and I only mention the incident to show that without the infinite patience of my employer I could never have succeeded. He was at that time the active head of the entire western organization of a large corporation, with enormous responsibilities and heavy duties, having a large office force, yet, with all his work, he never failed to take the time to go over the books personally with me and to balance my accounts each month, never leaving this work to his chief clerk or other subordinate. His encouragement was the one thing that held me to the task, and his faith in my ability to do the thing he had assigned to me. He never neglected an opportunity to tell me when I had done it well, and even now, after all my years of service, he never fails to say the kindly "thank you" for any duty performed, or to express his appreciation when it is well done.

The same thing holds true of his treatment of every member of the force. He is always zealous to see that the man entitled to the promotion receives it and is encouraged to the limit in his efforts to make good. When praise or commendation is deserved it is never withheld; on the other hand, when just criticism must be meted out it is always tempered with kindly consideration and friendly counsel, and no employe is permitted to remain unhappy without full opportunity being given him to talk matters over and reach an understanding. Every consideration is shown to employes who are in sympathy with the ideals of the organization and render loyal service to it, but any man who harbors continual discontent, to the extent that it interferes with loyal service, will receive only justice when an act of his calls for the attention of the "chief," although sentence will not be pronounced until both sides have had an opportunity to get together and discuss points of difference.

His friendly interest in the personal affairs of his staff is unfailing. One of my earliest recollections of this is in connection with the matter of savings, about which he held many frank and interested talks with his employes. He invited our confidence as to our financial obligations, pointing out the reasons why we should begin putting aside a certain sum every month—and let me add that it was not all for the proverbial "rainy day," a part of his programme being to provide funds for our pleasure and recreation.

The result of our first conference on the subject was an application for life insurance policies on the part of several of the younger employes and for memberships in building and loan associations on the part of others, many of whom could relate interesting tales of the pleasure derived from the expenditure of the amounts realized therefrom in travel, study and self-improvement; others rejoicing in the possession of their own homes. He holds the opinion that every man and woman who has been in active service for a long period of years owes to himself or herself the duty of an extended vacation, looking forward all the time to a promise of something to do on their return, rather than to give up work entirely and find no outlet for their activities. One of his plans for the staff is the encouragement of savings for this purpose.

In addition to advocating life insurance and other forms of savings among his employes, he is ever on the alert to be of service to them in all matters affecting their everyday life. He helps them build their homes, goes with them to inspect the layout, and many a man's walls or bookshelves contain reminders of his thoughtfulness in the shape of pictures or books that he thinks particularly appropriate.

That this interest is appreciated is evidenced by the fact that even the bootblack who daily shines his shoes comes to him with stories of his children's schooling, or asks his advice as to how to get a sick friend into the hospital, etc.

Generous as he is in giving of his time during business hours, he is equally generous in sharing with his co-workers the joys of his home life, and numerous are the men and women who have received renewed strength, as well as inspiration and a fresh courage, from a visit in his home and the example of the unfailing optimism of his family.

His sense of justice and his kindly encouragement and consideration of everyone with whom he works has inspired in them all a spirit of determination to do their best.

His interest does not cease with the severance of business relations. Many a time he has remarked: "Mr. So-and-So has had to give up work and has gone to live quietly in a retired spot; please put him on the list and let us send him an occasional letter and some reading matter—we don't want him to feel that he is forgotten." The touching replies to such communications are proof of the value of the personal touch, and add emphasis to the love which all hold for him. I quote from one of them:

"In my extremity you were my good friend; that I never shall forget. You did not realize it, but you saved my life."

[Mr. Edward J. Nally, vice-president and general manager, Marconi Wireless Telegraph Company of America, has been a conspicuous figure in telegraph circles for over a quarter of a century, having, by close application and incessant study, advanced through the various grades from messenger boy to his present rank.

He was born in Philadelphia, Pa., April 11, 1859. Before entering the wireless field he was the chief executive of one of the large telegraph corporations, and in that capacity visited every city and hamlet in the Union.

Since he became associated with the Marconi Company he has organized its commercial transoceanic service. In 1914 he opened the wireless circuit between California and Hawaii, which has operated so efficiently, and in November, 1916, he opened the first trans-Pacific radio circuit between America and Japan, operating in connection with the Japanese government.—Editor.]

Radio Clerks.

The United States Civil Service Commission will receive, until December 29, applications for examinations to fill vacancies in the office of Naval Communication Service, Washington, D. C., for radio bookkeeper and accountant, and auditing clerk. The salaries paid for these positions are $1,200 and $1,800 per year. Applications should be made to the Civil Service Commission, Washington, D. C., for the proper form of application.

Efficiency Engineering in the Telegraph Service.

(Continued from page 511, November 16.)

Progress is the watchword of the hour. If you are not progressing you are standing still, and if you are standing still you are naturally going backward. You are in a state of hesitancy, but are not progressing. The same illustration applies equally to individuals and corporations. It is just as easy for a company, no matter how large it may be, to lapse into a state of coma, which is another term for standing still, as it is for an individual to stop progressing. No person or corporation can stand still for any length of time. Their movements must be forward or backward. If the latter, the retrograde movement will be continuous until those interested have awakened at the sight of breakers ahead.

Many may say: How can you tell when a corporation is not progressing? That is the easiest thing in the world. A line repairer reports to the plant department that in his district there are many poles and cross-arms and insulators in a condition where it is necessary to make immediate repairs. Nothing is done to bring the plant up to standard. A chief operator makes requisition for instruments and other office paraphernalia, including supplies that are absolutely necessary to maintain the office at its usual standard of efficiency. Nothing is done about it. The manager makes requisition for certain improvements in his department which will prove attractive to the business men and a comfort and convenience to the office employes. Nothing is done about it. The delivery and receiving clerks report a wretched condition in the appearance of the messenger force. Their uniforms are old and delapidated and they are a disgrace to the service they represent. Nothing is done about it. Everybody is becoming disheartened and discouraged. The heads of the various departments talk among themselves and wonder what has happened at headquarters. A streak of economy has taken possession of the man at the head of the company.

When economy is carried too far it becomes extravagance. No one cares what happens, and everyone wastes. The receipts show a decided falling off. It then becomes a difficult matter for the man in charge of the property to explain to the executive committee or board of directors, and the result is a change is made and a new man is selected to restore the company to its old-time vigor. He has got to expend hundreds of thousands of dollars to restore the company's property to a condition where it will meet the requirements of the service. While the old management did not progress, it is quite apparent from reading these sentences that the company retrograded. The public lost faith in the company, as well as the employes, and the two together soon convinced the owners of the property that something was radically wrong and heroic remedies must be applied.

The new management was at once confronted with enormous bills for restoring the property. These expenses had to be met out of future earnings. If the management is made of the right stuff, enthusiasm is instilled into all of the local managers and chief operators, with the result that the difficult problems confronting them melted like snow on a summer's day. It is all a matter of leadership. You must progress or you will fall behind. There is no such thing as permanently standing still.

The case of an individual is just the same as a corporation. A person cannot expect to wear a suit of clothes forever. He begins to look shabby and his appearance excites unfavorable comment. He must bring himself up to date occasionally by purchasing a new suit. He must progress, and that is the only way to advance. His employing company studies new methods in handling the business. An inspector conveys to him new wrinkles in traffic management. He does not see the necessity of changing, old forms and methods being good enough for him. He ceases to progress. He is standing still. His office methods, like his suit of clothes, are old and shabby. He needs renovating, and the inspector has a difficult task before him. He is either brought up to date or he is relieved of his trust. We cannot stand still. We must either progress or retrograde. What are you doing, pushing ahead or going backward?

(To be continued)

Teaching Telegraphy Phonetically.

FROM A LONDON CORRESPONDENT.

I cannot admit the statement in your October 16 issue that the system of teaching telegraphy phonetically is "destined to become universal." The writer is not by any means a deep-dyed-in-the-wool adherent of the old system, and can prove it by performances during thirty-three years' experience on both sides of the Atlantic, having during that time taken up every new system introduced in both countries, some of which Mr. Weiser has probably never heard about. But to get back to the teaching: There is "some" merit in the scheme, but it is very limited, and so are the powers of the operator. If we learned French in the same manner, we should not be able to read or write it! Then, again, take shorthand; my stenographer may be tip-top at taking my letters dictated, but a bad speller when typing them afterward.

There are two arguments against the system, but by far the most important from the telegraphy point of view is the undeniable fact that an operator so trained would be useless for Wheatstone or recorder work, owing to his entire ignorance of the makeup of the code. Neither Wheatstone nor recorder have handed in their checks so far, notwithstanding the tremendous strides made in wireless and printing instruments, and we must never lose sight of the fact that one of the big Atlantic cable companies built up its reputation for accuracy in its early days by transmitting all messages by hand, while its opponents used Wheatstone.

Some squander time, some invest it, some kill it. That precious half hour a day which many of us throw away, rightly used, would save us from the ignorance which mortifies us, the narrowness and pettiness which always attend exclusive application to our callings.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are: "American Telegraphy," by Wm. Maver, Jr., "Radio Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telegraphy.

Another arrangement of generators for telegraph purposes, differing from that described, is shown theoretically in Fig. 1. It is in use in the main offices of the Postal Telegraph-Cable Company, New York City, and elsewhere. In this arrangement the generators are not connected in series, but each machine is operated separately as shown in the figure. Each machine may be considered as the equivalent of a gravity battery of very low resistance out of which a large number of wires are "fed." In the New York plant there are sixteen machines furnishing eight grades of negative and positive potential, namely, 50, 70, 90, 110, 200, 250, 275 and 300 volts respectively. (In the figure only the three positive machines are shown; the connections of the three negative machines are exactly the same as in the positive machines.) One pole of each machine is connected to ground, the other pole is connected to a switch S, and thence to the wires. By means of this switch any machine can be readily disconnected and another substituted. Two spare machines are provided and these have switches so connected that the line wire terminal and ground terminal may be readily transposed to furnish a desired polarity. A resistance R^1 R^1 R^1, consisting of German silver wire, is inserted in the circuit of each wire before the operating room switch is reached. The machines are shunt wound. The electromotive force of each machine may be varied by the removal or insertion of resistance from the rheostat R in the field magnet circuit. The machines are driven by a suitable motor. To prevent injury to the apparatus, due to accidental short-circuiting, fuses F are inserted in each generator circuit at the switch S. These fuses "blow" out under a heavy current, thereby opening the circuit.

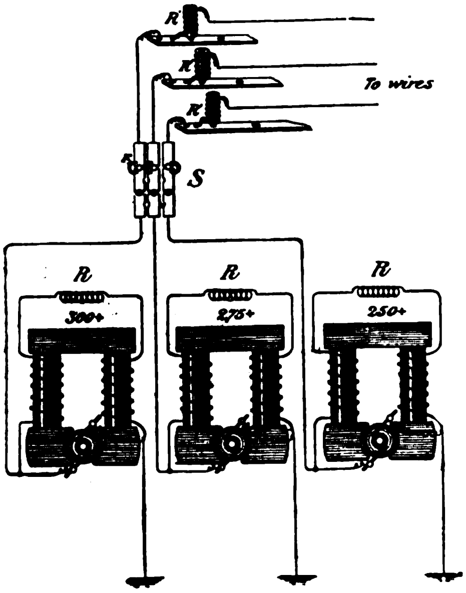


FIG. 1—POSTAL TELEGRAPH ARRANGEMENT OF GENERATORS.

(To be continued)

QUESTIONS ON TELEGRAPHY.

How are the generators in the main office of the Postal Telegraph-Cable Company connected?

How many grades of potential are supplied by the machines in the New York plant?

Are the machines connected to the ground?

Radio Telegraphy.

There is another useful type of inductance called the variometer, which consists essentially of two coils connected in series or parallel, as desired, one of which is movable with respect to the other. In some cases one coil is arranged to slide past the other in a plane parallel to its windings, as indicated in Fig. 1; in other cases one coil is rotated inside the windings of the other, as indicated in Fig. 2. In the second type, when the coils are in the same plane and the windings are connected so that the current is circulating through them in the same direction, the two magnetic fields are helping each other and the inductance is a maximum. If, now, one coil is rotated through an angle of 180 degrees, the two fields are opposing and the inductance is a minimum; for intermediate angles the inductance will have some intermediate value. The variometer thus has the advantage of giving a continuous change of inductance without moving clips or contacts, but has what may be, under certain conditions, the disadvantage of not giving zero inductance at its minimum position and of always having the resistance of all its wire in circuit. A variometer is generally used in connection with a

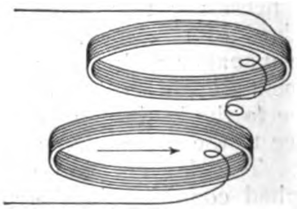


FIG. 1—SLIDING COILS.

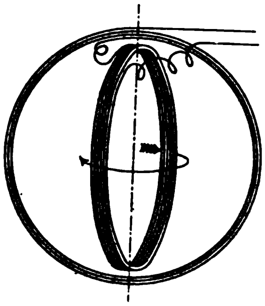


FIG. 2—ROTATING COILS.

helix or coil, variable only by steps, to give intermediate values of the inductance as mentioned.

(To be continued)

QUESTIONS IN RADIO TELEGRAPHY.

What is a variometer?

How are the coils of a variometer arranged with reference to each other?

What is the advantage and the disadvantage of a variometer?

Telephony.

In Fig. 1 is shown a portion of a somewhat complicated circuit to illustrate the use of the retardation coil as the holding coil for a relay. The function of the apparatus shown is to notify the central office operator that the circuit with which the retardation coil is associated has been connected to another line by means of the plug shown at the right of the diagram. When this plug is inserted in the jack it closes a contact which connects the retardation coil across the line. This allows current to flow from the central office battery through the relay, causing the latter to pull up and open the local circuit through the lamp. The going out of the lamp indicates that the connection has been properly completed. In this case the retardation coil prevents the waste of talking current passing over the line and at the same time allows a flow of direct current sufficient to hold up the relay. It will be noted from the diagram that the central office battery is cut off by means of condensers from the apparatus attached to the plug.

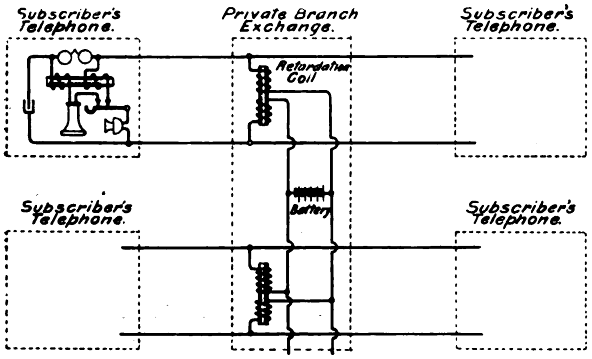


FIG. 1—RETARDATION HOLDING COIL FOR RELAY.

(To be continued)

QUESTIONS ON TELEPHONY.

What is the function of the apparatus shown in Fig. 1?

When the plug is inserted in the jack, what is the effect?

What is indicated by the lamp extinguishing?

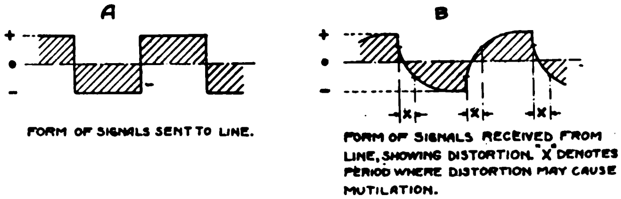
How is the central office battery cut off?

The Western Union Multiplex.

(SYNCHRONISM—*Continued*)

It will be noted here that the receiving segments are made shorter than the sending segments, so that the receiving brush E_1 picks out only the center portion of each current impulse, or of each repeated current impulse, since the signals sent over the line are repeated by means of the polarized relay. Assuming perfect synchronism between the sending brush E and the receiving brush E_1, the receiving brush should be at the point C_1 midway between receiving segments 1^1 and 2^1 when the sending brush passes from segment 1 to segment 2; at C_2 midway between receiving segments 2^1 and 3^1, when the sending brush passes from segment 2 to segment 3, and so on. Thus, it will be seen that for a change of polarity, which can only take place when brush E passes from one segment to another, the receiving brush E_1 should be at some point in the circumference midway between two receiving segments. In other words, reversals of the line current should take place while the receiving brush is passing between receiving segments. The receiving distributor is therefore provided with additional rings R_2 and R_4, called correcting rings. R_4 is a solid ring connected consecutively to the segments in R_2 by the brush E_2. These segments are half the length of the sending segments, and are therefore double in number. They are connected into two groups—"a" and "b," as indicated. The brushes are so arranged that when the receiving brush E_1 is midway between any two receiving segments, say 1^1 and 2^1, the correcting brush E_2 is just about to engage one of the "a" segments, say at d_1. Circuit provisions are made so that a short pulse of current is generated locally at each reversal of the line current. This reversal finds the correcting brush E_2 on an "a" segment, and causes the operation of a mechanism which automatically sets back both brushes E_1 and E_2.

Now, if the motor driving the receiving distributor is arranged to run slightly faster than the motor driving the sending distributor, the tendency will be for brushes E_1 and E_2 to be gaining, and the intermittent stepping back as already described will result in maintaining the receiving brush E_1 in the proper phase with the sending brush E at the other end of the line. It will thus be seen that at each reversal of the line current, the position of the correcting brush on the segmented correcting ring determines whether a correction of phase relation shall be made. Since the motor at the receiving end is running faster than the one at the sending end, sooner or later it will engage an "a" segment, at the time of a current reversal. This causes the brushes to be stepped back a small angle, so that the current reversals take place only while the correcting brush is on "b" segments. Thus the signaling impulses are made to provide correcting impulses, which are used to maintain synchronism.



FORM OF SIGNALS SENT TO LINE.

FORM OF SIGNALS RECEIVED FROM LINE, SHOWING DISTORTION. "X" DENOTES PERIOD WHERE DISTORTION MAY CAUSE MUTILATION.

FIG. II—FORM OF SIGNALS SENT TO LINE.

The shortening of the receiving segments to one-half the length of the sending segments provides an ample angle for this purpose. It also possesses the advantage that only the center portion of the signal is utilized for signaling purposes, and the system is less subject to the effect of inductive disturbances. Diagram A, Fig. 11, shows the form of signals sent to line by the distributor. When the signals are received at the distant end, they are more or less distorted. Diagram B of Fig. 11 illustrates this distortion. It is near the point of reversal at the time the line current is weak that inductive disturbances are able to affect or further distort the signals. If any advantage were to be gained, the segments could be shortened still further, since the relays operated from them are connected in local circuit, and require a very short impulse for their operation. It will be appreciated, then, that the shortening of the receiving segments is not a sacrifice in any sense of the word. In actual practice the line is worked duplex and the sending and receiving distributors are combined and run by one motor, means of correction of synchronism being used at only one end.

(To be continued)

Shop Talk.

BY THE OBSERVER.

It is not to be inferred from our previous article that because a certain plant is having more than its share of trouble that it is not obeying every rule known to the art, but where a plant has more than a normal amount of trouble there is a reason. Sometimes it is due to the machines being old, the wires decayed by age, thereby leaving a loophole for frequent shorts and openings. Where such conditions exist the only real cure is to rewind the machines. It may be due to using improper fuses, or by overloading. The makers place a plate on the machine stating its capacity and such is irrevocable.

Be sure that there is never any large spark on either side of your motor-generators. If possible run them without any sparking.

In fitting your brushes be sure that they are properly spaced, and always trim back the copper plating on the brush so that it does not leave a sliver and carry a spark. If the copper plating is scraped back a half-inch from the commutator that is sufficient. Never use emery cloth on a commutator, but use sandpaper. Always lift the brushes when using sandpaper so that the dust will not embed itself in your brushes.

Always keep your machines well oiled, but never allow the oil to slop over on the commutator or armature. Oil has the tendency to rot the insulation. About once a week take your universal duster (blower) and blow out the whole machine and then wipe it off with cheesecloth. Do not use waste, as it catches in various places and worms itselfs into the machine and is harmful.

If after every precaution is taken you are still having difficulty, then the nature of the trouble will no doubt suggest a method of going after it. No matter what happens there is always a way out and by a little study and observation you will be able to overcome all minor defects. The major repairs to motor-generators, and all other classes of machines, must be left to the expert; but our duty is to try and forestall the need of the expert, that is, reduce it to a minimum.

How Batteries Are Connected Up.

There are three general ways on connecting up battery cells, viz: in series, in multiple and in multiple-series, the third being a combination of the first and second, as the term implies.

Fig. 1 shows how three cells are connected in series; Fig. 2, six cells in multiple, and Fig. 3, twelve cells in multiple-series. The difference in the number of cells has no significance in these illustrations; any number of cells can be connected up in any one of the three ways.

In Fig. 1 the positive element of each cell is connected with the negative element of the adjacent cell, forming a "series" of cells. This arrangement yields energy that has a voltage of three times more than that of one cell.

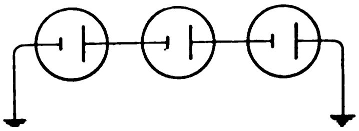


FIG. 1—CELLS IN SERIES.

In Fig. 2 all the positive elements are connected to one wire and all the negative elements to another wire. The energy delivered by this arrangement is equivalent to the voltage of one cell divided by six, but it gives six times the quantity of current than that from one cell.

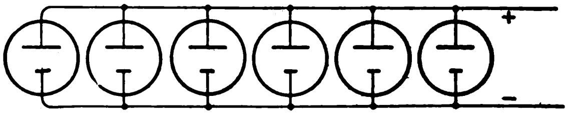


FIG. 2—CELLS IN MULTIPLE.

In Fig. 3 are shown two groups of six cells connected in series in each case, and the two groups are so combined as to form a multiple arrangement.

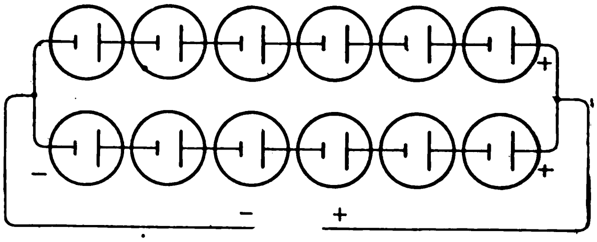


FIG. 3—CELLS IN MULTIPLE-SERIES.

These simple diagrams present to the mind a clear understanding of the different arrangements of cells, and the student can easily determine from them how the voltage and current vary according to the connections.

NEW COURSE.—The College of the City of New York has established a special course in the latest methods of calculation of electrical oscillations. The work will apply directly to the calculation of alternating current circuits, radio circuits, including coupled circuits of any kind. Telephone engineers, wireless engineers, general electrical engineers and advanced students in the college will be interested in this special course.

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TRANSMISSION

EDISON PRIMARY BATTERY DIVISION
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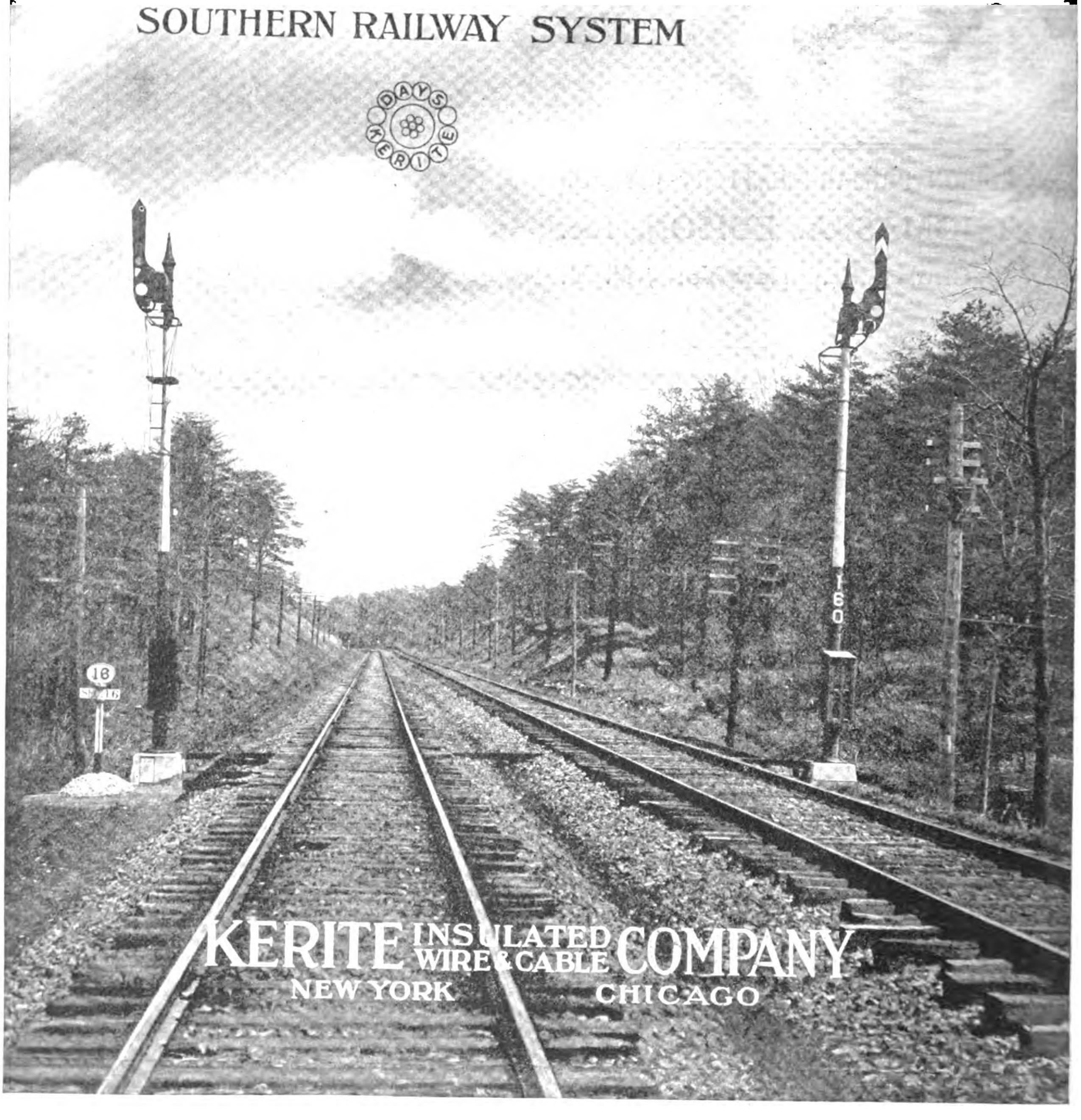

KERITE

SOUTHERN RAILWAY SYSTEM

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO

THE RAILROAD.

THE GREAT NORTHERN RAILROAD has taken over all of the property of the Western Union Telegraph Company along the road's right of way between St. Paul and Seattle, except such trunk wires as the telegraph company desires to retain for its through commercial business or its business with its individual offices along the line of said railroad. The transfer eliminates the old operating contract between the companies. A new one has been entered into which provides that the Western Union offices are to be maintained in the railroad stations. The Western Union through wires will remain on the railroad company's poles and its signs and blanks will be found at all of the railroad stations.

MR. I. D. HOUGH, superintendent of telegraph of the El Paso and Southwestern Railroad System, with headquarters at El Paso, Tex., has received a commission as major and been assigned to duty in Washington, D. C. Major Hough, accompanied by his wife, was a New York City visitor on November 21. He was one of the best known telegraph experts in the Lone Star State, and his numerous friends in New York were pleased to greet him and his estimable wife on their recent visit to the city.

MESSRS. E. A. BURKITT, general foreman, Illinois Central Railroad, Chicago, and G. A. Dornberg, general foreman, Pennsylvania Lines West of Pittsburgh, were in New York recently attending a meeting of the Sub-Committee on Transposition of the Association of Railway Telegraph Superintendents.

MR. C. S. RHOADS, superintendent of telegraph, Cleveland, Cincinnati, Chicago and St. Louis Railroad, Indianapolis, Ind., was a recent New York visitor. He came to see his son, R. B. Rhodes, lieutenant in the aviation corps, before the latter left for France.

Major C. G. Baird, Telegraph Battalion, Signal Corps.

Mr. C. G. Baird, division operator of the Pennsylvania Railroad Company at New York, has been appointed Major in the 413th Telegraph Battalion (Railroad) Signal Corps. Major Baird was one of the most popular and thorough railroad telegraph men in New York and his host of friends wish him every success in his future railroad military career. During the Spanish-American war he rendered valuable services to the government, both in this country and in the Philippines.

He will be succeeded as division operator on the Pennsylvania Railroad by A. Y. Tomlinson.

Major Baird is in charge of nine officers and 215 experienced men, including train dispatchers, railroad telegraphers, signalmen and linemen. He is a prominent member of the Association of Railroad Telegraph Superintendents.

Statistical Information.

The statistical information about telephone and telegraph service on the various railroads of the country, which we publish annually at the time of the yearly meeting of the Association of Railway Telegraph Superintendents, will appear in our December 16 issue. It was intended to present it in this issue but owing to the delay in receiving the reports from six railroads it was thought best to hold it over one issue in order that it might be complete.

This table will show the number of miles of road operated by telegraph and by telephone, also the roads using printing telegraphs in their service, and the mileage of such circuits.

Meeting of Eastern Division of Association of Railway Telegraph Superintendents.

The Eastern division of the Association of Railway Telegraph Superintendents met at the Hotel Lasalle, Chicago, on November 22, just prior to the meeting of the main association at the same place.

Owing to the absence of Chairman W. P. Cline, Mr. J. F. Caskey presided. After the reading and approval of the minutes of the New York meeting, November 22, 1916, Mr. E. C. Keenan stated that as there was no particular business to transact he moved that the meeting adjourn to merge with the special meeting of the entire association to be held at 9.30 a.m. The motion was carried.

The names of those present are included in the list of attendants at the main meeting.

Special Meeting of Association of Railway Telegraph Superintendents, Chicago, November 22.

A special meeting of the Association of Railway Telegraph Superintendents was held at the Hotel Lasalle, Chicago, November 22, at which about seventy-five members and visitors were present. President M. H. Clapp was in the chair. He referred to the postponement of the annual meeting at Washington on account of the war conditions and the calling of this special meeting in its stead. He said the annual meeting next year would be held at a place and time to be decided upon by the executive committee.

Col. Leonard D. Wildman, Signal Corps, U. S. A., was introduced and gave a talk on the activity of the United States Government through that department of the army, as regards the signal service. He explained the need of a large number of experienced telegraph men, operators in the United States Signal Corps, and urged railroads to do their part in training such men.

A rising vote of thanks was extended Col. Wildman for his patriotic and instructive address.

Mr. E. C. Keenan called attention to the service flag with seven stars hung in the meeting room, mentioning particularly Charles G. Baird, division operator Pennsylvania Railroad, New York, who has entered the United States Signal Corps as major, and is now about to leave for France in charge of the 413th Railroad Telegraph Signal Battalion, comprising ten officers and 215 enlisted men.

Mr. Keenan named the following men in the service from the Association of Railway Telegraph Superintendents, besides Major Baird: F. E. Camp, inspector of telegraphs, Canadian

Pacific Railway, Brandon, Man.; Claude Mitchell, superintendent telegraph, Gulf Coast Line, Houston, Tex.; T. F. Caldwell, superintendent telegraph, Grand Trunk Railway, Winnipeg, Man.; J. H. McGlogan, assistant superintendent telegraph, Great Northern Railway, St. Paul, Minn.; C. O. Van Der Vort, engineer telegraph department, Michigan Central Railroad, Detroit, Mich.; P. H. Chapman, National Electric Specialty Company, Toledo, Ohio; I. D. Hough, superintendent telegraph, El Paso and Southwestern Railway, El Paso, Tex.

Mr. Keenan moved, as a token of esteem and appreciation of the service rendered by the members of this association who enlist in the army and navy, that all active and associate members who enter the service of the national army and navy of the United States and Canada shall have their names entered upon a roll of honor of this association for army service, and further, that the dues of such members be annulled for their term of service in the present war. The motion was carried.

Then followed reports of the several special committees.

Mr. J. F. Caskey, chairman of the membership committee, reported names of twelve new members elected as follows: G. D. Hood, superintendent telegraph, Chicago, Rock Island and Pacific, Chicago, Ill.; J. J. Rounds, superintendent telegraph, Delaware and Hudson, Albany, N. Y.; J. H. McGlogan, assistant superintendent, Great Northern Railway, St. Paul, Minn; H. C. Chace, superintendent telegraph, Atchison, Topeka and Sante Fe, Topeka, Kan.; J. A. Jones, superintendent telegraph, Southern Railway, Charlotte, N. C.; W. R. Bert, electrician, telegraph department, Southern Pacific Railway, San Francisco, Cal.; John B. McGregor, chief inspector, Grand Trunk Railway; D. R. Tancey, superintendent telegraph, St. Joseph and Grand Island, St. Joseph, Mo.; A. W. Deansprie, assistant superintendent telegraph, Southern Railway, Charlotte, N. C.; N. W. Jones, superintendent telegraph, Reading Railway, Reading, Pa.; M. H. Brown, superintendent telegraph, Oregon Short Line, Salt Lake City, Utah; Percy Hewett, superintendent telegraph, Southern Pacific, Houston, Tex.; I. D. Hough, superintendent telegraph, El Paso and Southwestern, El Paso, Tex.

Associate Members.—T. R. E. Payton, railway agent, Central District Telephone Company, Pittsburgh, Pa.; Jay G. Mitchell, engineer and sales manager, Frank B. Cook Company, Chicago; Leslie J. Jenks, Carthage, N. Y.

Mr. G. A. Cellar, chairman sub-committee on wire crossings of Committee No. 1, reported progress. He stated that the Public Service Commission of Pennsylvania had adopted the National Code parts one, three and four, but for crossing specifications, adopted a report presented by a special committee formed for the purpose of preparing specifications for the Pennsylvania Commission. The National Safety Code has been adopted by twenty-two states, six industrial commissions, three insurance departments and fire marshals' organizations, three insurance bureaus, and two municipalities.

Sub-committee on transpositions, by Mr. Dornberg, suggested that railroads in creating telephone circuits, both physical and phantom, follow Western Union Provisional Specifications No. 615-A, recently issued, which are based upon engineering data, and specifications gotten up by the American Telephone and Telegraph Company.

Mr. Dornberg stated that the report of sub-committee on underground construction would be submitted to the next annual convention.

The chairman of Committee No. 1, Construction and Maintenance of Outside Plant, reported that committee on pole line specifications had prepared a preliminary draft of specifications for pole lines, but it was not in form for submission at this meeting. It is hoped the Committee will have it ready for the annual meeting next fall.

Arrangements will be made to have a special subcommittee coöperate with the United States Bureau of Standards so that the specifications of the Association of Railway Telegraph Superintendents, covering pole lines, wire crossings, etc., shall be consistent with the safety code rules recommended by the government. The personnel of this committee will be announced later by President Clapp.

Special Committee No. 2, Construction and Maintenance Inside Plant, Mr. R. F. Finley, chairman, reported progress, and expected to have a report for next annual meeting.

Special Committee No. 3, Wire Chief Equipment and Routine, Mr. E. A. Chenery, chairman, reported progress and promised a report for the next annual meeting on the particular subject of specifications covering test panel circuits in way stations and apparatus. The specifications for wire chief equipment and routine were completed at the last annual meeting.

Mr. J. F. Caskey, chairman Committee No. 5, Protection Against Lightning and High Tension Circuits, made a report in part and promised a more detailed report for the next annual meeting.

Mr. E. C. Keenan, chairman Committee No. 6, Telephone and Telegraph Equipment, stated that his committee had under construction four new devices representing improvement of detail. A report will be made to the next annual meeting.

President Clapp announced that he had assigned to Committee No. 7, Railroad Message Traffic, some special work in connection with the shortage of telegraph operators, and plans for schools for teaching telegraphy. F. T. Wilbur, chairman, reported a number of telegraph schools in operation and others under consideration. Nineteen Morse schools are maintained by various railroads. Two thoroughly equipped schools in operation are, one at Philadelphia and one in San Francisco. The committee recommends that every endeavor should be made to promote the study of telegraphy, either by the establishment of railroad telegraph schools, private schools of merit or by employing helpers at way stations.

The need of telegraphers was emphasized by all the speakers, and different methods of teaching and of obtaining students were discussed, the phonetic method being considered. Some suggested free tuition, some nominal charge to secure good faith,

(*Continued on page 550*)

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How to Secure Subscribers to Telegraph and Telephone Age.

Among the letters mailed by local agents of Telegraph and Telephone Age to those whose names ought to be on our subscription list, the following copy has been suggested by one of our agents, Mr. J. B. Dillon of Little Rock, Ark., as possessing "pulling qualities." It is printed here so that other agents can copy the language and style, making the necessary changes to suit local conditions.

Dear Sir: The greatest philosophers of the twentieth century have stated many times that the best avenue for a man to become posted in his chosen profession is via the trade journal devoted to his particular vocation. The reason for such a plain statement is because a trade paper is made up of articles from the field, and every article of such a nature means knowledge of the subject written about. A better source for instructive news is impossible. You will now readily understand why a trade journal is so highly valued.

In looking up the record of a person our guarantee companies go back many years and base present merit upon what the past reveals. Now go back thirty-five years and look over every issue of Telegraph and Telephone Age and you will find it brimful of only such news matter that tends to instruct and uplift. There you will find practically every article that is contained in the Jones' book for telegraph engineers, a pocket book that has no equal in the United States. You will find hundreds of timely articles, both technical and entertaining, written by well known people, but never anything of an undesirable nature. You will also find the names and whereabouts of your old friends as they moved from place to place. Such has been the policy of the Age for thirty-five years, and such will be its policy as long as the paper is conducted under its present management. In every issue of the Age you will find an Educational Section, the articles therein being devoted to the telegraph, telephone and wireless. Every article is from a reliable source and so varied are these contributions that the twenty-four issues received in one year will contain more valuable matter than any one book you could buy at several times the cost of a subscription. In fact the paper contains many excellent articles that you would be unable to secure anywhere else. The subscription is $2.00 per year, the paper being issued semi-monthly—that is less than ten cents a copy.

Begin the new year 1918 right by giving us the pleasure of adding your subscription to our list, for we feel sure it will be for our mutual benefit.

Address all orders and make remittances to J. B. Taltavall, publisher, Telegraph and Telephone Age, 253 Broadway, New York.

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(Continued from page 548)

others paying a bonus to telegraphers who produced students capable of taking stations, and the employment of women as agents and telegraphers. But the main thing was to get telegraph operators, by training or teaching young men and women so as to fill gaps made by the government taking trained men into the signal corps, and the alluring wages offered in other lines of work under present conditions.

The report was accepted as information for the association.

A report of Committee No. 8, Commercial Telegraph Service, was made by Mr. S. L. Van Akin for Chairman E. P. Griffith and accepted as a progress report.

Under direction of President Clapp a special committee of three members, Messrs Cellar, Chenery and Keenan, made a very thorough report, with recommendations on the subject of Conservation of Telegraph and Telephone Service Regarding Railroad Business.

The report, in substance, recommends:

1. That all unnecessary telegraph and telephone service, including superfluous words in messages, be eliminated, the mail to be used for all communications which are not absolutely necessary to be transmitted by wire.

2. That concerted action be taken by the railroads to curtail the tracing of freight and reporting of car movement by wire, and to secure the coöperation of shippers and government officials to this end.

3. That code and symbol systems and the practice of censoring of telegraph and telephone service shall be more generally used.

4. That on account of the shortage of telegraphers the construction of additional telephone circuits shall not be deferred because of the war, but shall be prosecuted with vigor in order to supply facilities for handling traffic by non-telegraphers.

It was also recommended that the secretary be directed to have printed and send a copy at once to each member of the association and to the president or general manager of each railroad in the United States and Canada, and further, submit this report to the American Railway Association with a request that such action be taken by that body as will insure the putting into effect these recommendations.

The report was, after a general discussion, adopted.

Mr. J. Edwin Dempsey, the cipher code expert of Chicago, told of the work recently done by him in compiling a telegraphic cipher code for the United States War Department, now used by all roads in communications regarding movements and routing of troop trains, which code insures secrecy and effects a large saving in telegraph charges. The Dempsey Code is in use generally on several railroads, and efforts are being made to have it more generally followed in line with the association's recommendation about the conservation of telegraph service.

An executive session was held from 5 to 6 p.m., at which hour the meeting adjourned.

While this special meeting was curtailed to a one day's session on account of war conditions demanding that the superintendents of telegraph stay close to their railroads, the subjects and general discussions of the problems were very well considered and will undoubtedly aid in handling the business in connection with railroad telegraph and telephone service, for which this organization is maintained.

The Telegraph and Telephone Appliance Association, which is affiliated with the Association of Railway Telegraph Superintendents, entertained the members and visitors in attendance at luncheon during the intermission at noon time. There was no other entertainment.

Among those present were:

Albany, N. Y.—J. J. Rounds.

Atlanta, Ga.—W. H. Adkins.

Chicago, Ill.—A. A. Barber, W. E. Bell, J. C. Binning, E. A. Burkitt, O. F. Cassaday, J. Edwin Dempsey, P. W. Drew, J. P. Edwards, John H. Finley, C. W. Fraher, C. H. Gaunt, H. E. Hewes, G. D. Hood, W. A. Jackson, J. M. Lorenz, E. Parsons, E. A. Patterson, Geo. O. Perkins, C. B. Semple, G. R. Stewart, W. W. Watt, F. T. Wilbur, A. Wray, M. B. Wyrick, F. H. Van Etten, J. H. Young.

Charlotte, N. C.—J. A. Jones,

Cleveland, Ohio.—A. Behner, R. F. Finley, C. S. Pflasterer.

Decatur, Ill.—J. P. Church.

Denison, Tex.—W. H. Hall.

Denver, Col.—F. A. Cannon.

Detroit, Mich.—J. J. Ross, G. W. Trout.

Gibson, Ind.—W. L. Connelly.

Houston, Tex.—Percy Hewett.

Indianapolis, Ind.—Stanley Rhoads.

Jersey City, N. J.—E. P. Griffith.

Kansas City, Mo.—R. L. Logan.

Lincoln, Neb.—H. A. Vaughan.

Louisville, Ky.—R. R. Hobbs.

Memphis, Tenn.—J. E. Drewry.

Minneapolis, Minn.—L. H. Merrill.

New Haven, Conn.— N. E. Smith.

New York.—G. K. Heyer, B. A. Kaiser, E. C. Keenan, W. W. Ryder.

Pittsburgh, Pa.—G. A. Cellar, G. A. Dornberg.

Roanoke, Va.—G. W. Jett.

South Bethlehem, Pa.—J. F. Caskey.

Springfield, Mo.—H. D. Teed.

St. Paul, Minn.—M. H. Clapp, J. C. Rankine, Geo. Boyce.

St. Louis, Mo.—E. A. Chenery, A. F. Eyerman, W. Rogers.

Syracuse, N. Y.—S. L. Van Akin.

Valparaiso, Ind.—G. M. Dodge.

Mr. B. E. Sunny, president of the Chicago Telephone Company, Chicago, and an old-time telegrapher, in renewing his subscription for another year, writes: "I congratulate you on the thirty-fifth anniversary of your work at the head of TELEGRAPH AND TELEPHONE AGE. It is a wonderful record. No one can estimate the amount of information, entertainment and help that you have given to so many people, scattered all over the world, through all these years. You have my best wishes for a long continuation of the good work."

Electrolysis.

(Continued from page 517, November 16.)

The existence of an overload condition can be determined by measuring the potential drop over a short length of rail whose size and resistance is known, and which contains no joints, and then calculating the current. Negative feeders can also be tested in a similar manner to determine whether they are overloaded, but such tests should always be by or in the presence of men who are thoroughly familiar with the feeder installation, so as to avoid all danger of injury through contact with positive feeders.

After the presence of overloading in tracks or feeders has been verified, the matter should be brought to the attention of proper railway officials with a request that remedial measures be adopted, if practicable. Since changes of this kind can only be planned and provided by engineers of the railway company, the efforts of the telegraph company should be devoted principally to proving the need of such measures and pointing out what seems to be the practicable and economical manner of applying them.

RE-ARRANGEMENT OF NEGATIVE FEEDERS. The advantages of an insulated negative feeder system have been previously pointed out at considerable length. It therefore follows that careful consideration should be given to the possibility of providing such an arrangement whenever a survey has shown the presence of high track drops not caused directly by poor track conditions. In some cases simply a rearrangement of existing feeders may be found sufficient, while in others improved conditions may be possible only at the expense of new feeders.

Whenever it appears practicable to mitigate electrolysis dangers by changes in the return system of an electric railway, the matter should be very clearly explained to the railway officials, and strong efforts made to secure their coöperation in the designing and installing of mitigative measures. It is understood, of course, that the planning of railway feeder systems must be done by railway engineers, and hence any specific suggestions made by the telegraph company should be very carefully considered in advance.

PROTECTIVE MEASURES: C.—APPLICABLE TO CABLE SYSTEM.

GENERAL. Among the measures previously mentioned for the mitigation of electrolysis were the reduction of positive areas of cable from which current might leave and increasing the resistance of the cable sheath. Although it is preferable to provide protection by removing the cause of danger, or modifying the source of stray current, complete protection is sometimes possible only through a combination of measures applied to both cable and railway systems. It often happens, also, that the conditions are so serious or the negotiations with a railway company so prolonged that temporary protection is absolutely necessary. The measures described in the following, therefore, are to be regarded as alternative or supplementary measures, except when specifically stated otherwise.

Drainage Wires.

GENERAL. Drainage wires are insulated conductors which connect points of high potential on a cable system to points of low potential on an electric railway return system. The points on a cable system where the connections are made should be where the cable is most positive and in the most danger from electrolysis. The point of lowest potential in the railway system is usually the negative bus at the power station. In some cases, however, drainage wires are connected to negative feeders and even to the tracks themselves.

THEORY OF CABLE DRAINAGE. The purpose of a drainage wire is to conduct the stray railway current to the railway negative return circuit, thus preventing this current from flowing directly from the cable sheath to earth and causing corrosion from electrolysis. In order to be effective, the drainage wire must be so located and of such conductivity that the cable sheath will everywhere be at a lower potential than the adjacent earth.

OBJECTIONS TO DRAINAGE WIRES. In so far as drainage wires make a cable negative to earth, they are very effective in protecting against electrolysis and thus they have come into fairly common use by telephone and telegraph companies. They have certain disadvantages, however, which should not be overlooked, but which should be carefully considered in connection with all drainage propositions.

In the first place, cable drainage does not remove the cause of electrolysis, but simply relieves the immediate effects. In fact, it increases the leakage of current from a railway system instead of decreasing it. One of the results of this is to so lower the potential of a cable and the earth adjacent to it that other neighboring cable or pipe systems will be endangered by a flow of current from them through the earth to the more negative cable system. This condition may not be serious when the cable occupies conduit that is usually free from moisture and standing water, and it can be prevented by bonding all neighboring underground metallic systems together, but such bonding is not often practicable, or in the case of pipe systems, even desirable.

Since drainage connections invariably increase the current flowing in a cable sheath, they may sometimes cause a corrosion in the negative portions of a cable. In certain soils the flow of current into a cable sheath may set free an excessive amount of alkali at the surface of the sheath. This alkali will act chemically on the lead of the cable sheath and cause corrosion which may ultimately be as serious as the electrolytic corrosion which the drainage wire prevents elsewhere. Soil corrosion is usually less rapid than corrosion from electrolysis, and consequently its development may take place so long after the installation of drainage that its real cause may be very obscure. A chemical analysis of the soil immediately surrounding a cable that has failed, supplemented with electrolysis tests, will usually reveal the cause of corrosion, but it is difficult to determine in advance whether soil corrosion such as just described will result from any particular drainage connection. In all cases, however, it should be guarded against by draining off only enough current to make the cable safe. This current can be controlled by the amount of resistance in the drainage wire.

Another condition that occasionally makes cable drainage objectionable is the presence of insulated joints or other breaks in the continuity of the sheath. When there is a break in the sheath, the increased current caused by drainage from one portion of the cable tends to produce considerable differences in potential between the sheaths on the two sides of a break. This difference in potential may make one side of the joint positive to earth and the other side negative, with a resultant current flow around the joint. The corrosion thus caused on one side of the joint might be entirely absent if there were no drainage. For this reason, drainage is most always objectionable for pipe lines which may have considerable resistance at the joints, but the effect is comparatively rare in cable systems on account of the comparatively few breaks in sheath continuity.

Although the preceding paragraphs outline what may be very serious drawbacks to the use of drainage wires, it must be borne in mind that the factors here described do not exist in many cable systems, and consequently drainage is frequently the simplest remedy for electrolysis as an alternative after other possible remedies have been investigated and found impracticable. When the length of a drainage wire is long, however, the cost is likely to be so large that other protection must be provided.

KINDS OF DRAINAGE. So far as practicable all drainage wires should lead to a negative bus, the potential of which will be least affected by load conditions. Connections to negative feeder wires are satisfactory when the feeder is not overloaded or subject to excessive potential variations. Connections to rails are objectionable and should never be made unless it is impracticable or too expensive to run to a negative feeder or bus. The danger of bonding to rails lies in the possibility of broken rail bonds forcing large railway currents into the cable system. Such currents might easily be large enough to be hazardous as well as to cause excessive electrolysis elsewhere.

Drainage wires should preferably be insulated from ground. They may be installed either on poles or underground in conduits, the method used in any case being chosen principally from considerations of cost and freedom from interruption, either physical or electrical. Electrical hazard must be guarded against in all cases.

EXPERIMENTAL DRAINAGE WIRES. The possibility of reducing electrolysis dangers by drainage is first determined by potential tests made between the most positive points on a cable and various points of the railway return system. The most suitable points to connect by drainage wire will be those between which the smallest flow of current from the cable will make it safely negative to earth. Possibilities of current reversals in the drainage wire are an important factor in deciding upon drainage, and naturally the cheapest connection will always be chosen when there are two or more points to which drainage connections will be equally effective. It is seldom that a permanent drainage connection is installed until some sort of a temporary connection has proved the effectiveness of the connection and the size of wire required.

CURRENT REVERSALS IN DRAINAGE WIRES. Due to load fluctuations or to shutting down of one or more power stations in a railway system, the current in drainage wires sometimes reverses and flows toward instead of away from the cables. Such current reversals usually create positive conditions on the cable, either at that point or elsewhere, and hence some means must be provided to prevent this introduction of stray current onto the cable sheath. This can be accomplished by opening the drainage wire during such times as the reverse current tends to flow.

When the reversals occur simultaneously with the shutting down or starting of a power station, and last only during such periods of idleness or operation, it is practicable to install a manual switch in the power station and have it operated at the proper times by the station attendant.

Where reversals of current occur at irregular intervals due to load fluctuations, etc., or where it may be inadvisable or impracticable to depend upon the power station attendant for the manual operation of a switch, resort must be made to automatic means for opening the drainage wire. Such means consist of automatic switches operated by polar relays, the apparatus being so designed that the drainage connection will be opened whenever the current falls to zero, or slightly reverses, and closed whenever the potential tending to make current flow from the cable rises to a certain value, usually somewhat less than half a volt.

TEST WIRES. When experience has shown that some important drainage wire is not reliable, either due to interruption or to unreliable operation of a switch, it is advisable to have a test wire between an office and the cable at some point where dangerous conditions are liable to develop. Such a test wire makes it possible to frequently test out the drainage connection, and make sure that it is intact and working properly.

A Valuable Book.

MATHEMATICS FOR THE PRACTICAL MAN is the title of a very valuable and useful book for practical men, students or engineers. It is not intended to teach arithmetic or higher mathematics but presupposes that a man already has a working knowledge of these subjects. From that point the mathematics are treated in a popular way and the book enables one to readily understand the subject. It is a book of examples and explanations rather than one of instruction, and every telegraph and telephone student and engineer will find it very useful in the prosecution of his studies and in his every day work. It covers fundamentals of algebra, some elements of geometry, principles of trigonometry, logarithms, principles of co-ordinate geometry, and principles of the calculus. A careful study of this book gives one a deep insight into the beauties of mathematics. Mr. George Howe is the author. The price is $1.25 per copy. Copies may be purchased of TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

MUNICIPAL ELECTRICIANS

Police Signaling Systems.

For the complete and proper administration of city affairs, and to keep up with the march of progress in police work, it has become essential that a police department shall be provided with means for getting into quick communication with patrolmen and other members of the police force, as well as means for patrolmen to make reports, and for citizens and city officials to send instantly to headquarters news of trouble requiring police supervision.

A police signaling system, to be complete and adequate in supplying all of the emergencies and needs of a police department, must, according to the Gamewell Fire Alarm Telegraph Company, have nine different operative features, as follows:

1. Means for patrolmen to signal, from time to time, their different positions and locations, from outlying points, to police headquarters.
2. Means for patrolmen to send emergency signals for a patrol wagon or for help without depending upon the telephone.
3. Means at headquarters for automatically and arbitrarily recording the numbers of all signals, indicating the exact location from whence they are sent.
4. Means at headquarters for automatically and arbitrarily recording the exact time of the receipt of all signals, giving the minute, hour, day, month and year.
5. Means for providing telephone communication between police headquarters and outlying stations over private and independent wire circuits. (To guard against possible espionage these wire circuits should enter no points other than police headquarters, for any purpose whatever.)
6. Means for audible signaling to patrolmen and other members of a police force from police headquarters.
7. Means for visual signaling to patrolmen and other members of a police force from police headquarters.
8. Means for selecting and signaling any single member of a police force from police headquarters
9. Means for signaling all of the members of a police force collectively from police headquarters.

The importance of each of these features, required in the make-up and operation of a complete modern police signaling system, have a relative equal value, and four of these features are furnished by the visual and audible outgoing selective recall portion of the system.

A complete modern police recall system is for signaling to patrolmen and to the other members of a police force when they are away from their headquarters, and the system can be installed without regard to the means now used by patrolmen for signaling and communicating from their beats or posts to police headquarters.

A system of this kind can properly be termed an electric roundsman, for it furnishes an effective instrument for locating and finding any one or all of the members of a police force within a few moments.

The recall system consists of units combining flashlights and bells, known as bell-lights, distributed throughout the municipal limits at points best suited to attract attention.

The recall units are accompanied and operated by weatherproof protected switches called controllers.

The regular commercial lighting service is used to supply the necessary current for burning the flashlights and for sounding the bells, and the current is switched into the units by means of the controllers, which are mounted closely adjacent to the recall units, on the same pole, building or other support.

The flashlight transmitter, which is located in police headquarters, is designed to carry from two to any number of circuits, and is equipped for sending out prearranged signals, manually or automatically, to a number or all of the recall signal stations.

The central office transmitter can be either motor or spring driven. It is connected by wire circuits to the various controllers, and is capable of operating the controller switches, in whole or in part, to sound the bells continuously or intermittently, or to flash the lights continuously or intermittently (independent of the bells), or to burn the lights steadily, at the will of the operator.

Through means of code signal discs with which the transmitter may be provided, the operator can single out and call to the nearest telephone any member of the police force without disturbing the movements of the others.

Liberty Bonds.

The Serial Building Loan and Savings Institution of New York sold to its members $41,600 worth of the first Liberty Loan Bonds and $46,450 worth of the second Liberty Loan Bonds. These results are very gratifying to the officers of the institution, who were pleased to do their bit in this way for the benefit of the government. The Serial Building Loan and Savings Institution reports an increased business and it is very likely that the bonus to be distributed by the Western Union Telegraph Company in December in New York City will be in a large measure placed on deposit with this financial institution, which is accomplishing so much good for members of the fraternity in providing them with homes and a safe depository for their earnings at five per cent. interest. The secretary is Mr. E. F. Howell, 195 Broadway, New York.

ASSESSMENTS.—The Telegraph and Telephone Life Insurance Association has levied Assessment 630 to meet the claims arising from the deaths of E. V. Abrams, Buffalo, N. Y.; G. F. Bell, New York; J. W. Dyer, Philadelphia, Pa.; M. Anderson, Memphis, Tenn.; E. Wolfsberg, Minneapolis, Minn.; C. Wagner, Brooklyn, N. Y.

Applicant—What's the chance for a fellow beginning at the bottom and working up?

Foreman of Gang—None; our job is digging holes.—*The Pacific Telephone Magazine.*

Signal Fire Telegraph.

The North American indians attained remarkable skill in signaling over long distances by means of fire and smoke. They combined flame and smoke into a definite code possessing a marked degree of elasticity, and in this accomplishment they excelled.

Upon a high point, commanding a view of the surrounding country, a warrior placed together a few fagots, carefully selected, in order that they be neither too dry nor too green. With a few stones the pile was arranged in the form of a cone. The conical shape provided a space in which to place dried twigs and brush. As the flame attacked the half green fagots, a spiral of smoke ascended.

The Indians could control the smoke spiral. Now it was heavy in volume; now lighter. At one time it was permitted to ascend in puffs of comparatively long or short intervals; at another, to fade away until almost invisible, and so on until the message was finished, when the smoke column ceased to be.

By this method of signaling the great Indian nations were enabled to communicate with one another. They developed a code known to all, and each tribe perfected signal codes known only to itself, so as to preserve secrecy of communication. In wind or rain signaling was frequently impossible, or could be carried on only with great difficulty.

In the capitol at Washington there is a painting on which is shown the Indian smoke columns giving warning of the invasion and passage of the white man into the western country.

A Good Book.

First Principles of Electricity. By J. E. Homans. Price $1.00.

In this volume, which is in a class by itself, the author undertakes to treat of the principles of the electrical science from the ground up. He reviews all the matters necessary to constitute a fundamental knowledge of all forms of electric current, and is very lucid in his explanations of obscure points. Nothing is omitted and nothing is slighted that is necessary to give the student and reader a thorough grounding in the science.

The illustrations are very clear and easily understandable, and altogether this volume certainly will be a great help to those who wish to learn the fundamental facts of electrical action and apparatus. Not only will it be useful to beginners but to advanced students as well, and also to practical electrical workers. For sale by TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

LETTERS FROM OUR AGENTS.

New York Western Union.

T. B. Clark, assistant chief operator, was married on November 19 to Miss Dorothy F. Weiler of Cliftondale, Mass. Mr. Clark is the son of T. F. Clark, formerly chief operator of the Boston office, now identified with the New York service.

Vincent Wallace, engineer detachment, Canadian Expeditionary Force, formerly an operator in this office, who served two years in France, has been recalled to the colors and has returned to France. Mr. Wallace received a silver medal for bravery under fire at Vimy Ridge. He was granted a six months' furlough, during which time he worked in this office.

Chas. S. Pike, assistant chief operator of the city division, is a proud father and wears a service pin, three stars indicating his three sons are in the army.

M. A. Noss, chief operator of the New Haven, Conn., office was a recent New York visitor.

L. C. Boochever, division traffic engineer, has resigned to engage in the banking business in New York. Mr. Boochever will leave the telegraph service about the first of the year.

Rehearsals are now taking place for the telegraph minstrel show to be given under the auspices of the Western Union Educational Society about December 8. One of the features will be a contest of filing clerks on roller skates filing business on a standard operating table. During other entertainments to be held throughout the winter months, one by expert telegraph operators will take place.

M. J. Hayden, district commercial superintendent in charge of the fourth Metropolitan district, Brooklyn, and about 200 of his managers, clerks, operators and messengers, gave their annual dinner and entertainment on Tuesday night November 20. Among the guests were: General Commercial Superintendent J. F. Nathan and wife; District Commercial Superintendents J. R. Hyland; A. Simon and wife; C. B. McCann and wife; Cashier J. A. Berry; Chief of the money order bureau A. A. McNeill; Chief Operator, G. E. Palmer; W. H. Matthews, chief of the complaint bureau, and other officials of the Metropolitan division. An excellent dinner was served, after which an entertaining programme, made up of home talent, was given and greatly appreciated and enjoyed.

John Rathbone, aged sixty-nine years, the well-known old-time New York telegrapher, identified with the main office for upwards of forty years, until two years ago when he was retired on pension, died November 23. He was born at New London, Conn., in 1848, and had been in the telegraph service since 1861. Mr. Rathbone had been in poor health for several years past.

Philadelphia Postal.

Jos. P. Collins of the operating department has accepted a position with the International Shipbuilding Corporation.

George L. McKeone, Pottsville, Pa., and J. C. McCollum, Atlantic City, have been transferred to the Philadelphia operating room.

Dr. J. A. Moran, formerly of this office, now practicing dentistry in Saskatoon, Saskatchewan, Canada, recently visited old friends in Philadelphia, accompanied by Mrs. Moran.

James Cheeseman, formerly stationman at Clinton, N. J., who enlisted in the Aviation Corps, was among the recent visitors here.

Alford G. Carpenter, office electrician, has returned from Trenton, N. J., after installing a new switchboard of the Skirrow type and making extensive repairs in that office.

H. B. Price of the cable department has been very busy repairing cables, damaged by "target practice" near one of the training camps near Philadelphia.

George L. Kohlbrenner of the superintendent's office has the sympathy of his friends in the death of his brother.

During the big Michigan-Pennsylvania football game on November 17, our composite telephone circuits were used to great advantage, assisting Manager Edward Price in handling the heavy press file quickly.

Boston Western Union.

G. S. Mann has been appointed chief operator at the South Station office, and G. H. Batho, who has been acting chief operator, returns to his former position, supervising eastern ways.

E. H. Lockwood, now located at the Charlestown Navy Yard, is one of the familiar faces seen in the operating room, helping out during the present rush. Mr. Lockwood was at one time cable operator in this office.

Miss C. A. Shea has been appointed assistant to H. E. Zinzer, instructor of the Morse School, and E. E. Fischer has been appointed instructor of the night class.

Repeater Attendant H. L. Flynn has received a cheerful letter from his son, Harry, Jr., located "Somewhere in France." Mr. Flynn's son, who is a member of the Signal Corps, writes that so far his trip has been a pleasant one and all are well.

Harry L. Palmer, Michael H. King and William J. Sheehan, all members of the Signal Corps, "Somewhere in France," have been heard from, and the reading of their letters assures us that their trip has been successful, and all report good health.

S. C. Tugo has resumed work after two months' illness. Mr. Tugo recently underwent a very seriout and painful operation.

On November 1 the Western Union Bowling League opened its second season, represented by six teams, one from each department, as follows: Branch managers (Captain A. E. Mann); Traffic (Captain H. E. Stickney); Commercial (Captain Thomas McCaffery); Plant, (Captain T. F. Nelson); Delivery (Captain T. E. O'Leary); Linemen (Captain H. E. Meyer). There will be the usual individual and team prizes at the conclusion of the season, and it has also been decided to hold the annual banquet at the close of the league.

A very pretty wedding took place at Saint Peter's Church, Cambridge, Mass, November 14, when Miss Margaret O'Connor, of the Morse force, this office, was united in wedlock to John Francis Barry, night supervisor of the Automatic Department.

W. G. Wetmore, division traffic chief, has left for Halifax, N. S., on a business trip.

St. Louis Western Union.

The Western Union Electrical Society held its regular monthly meeting on November 15. There was a fair attendance, and after the regular order of business an enjoyable entertainment was rendered by members and their friends. Miss Maud Wise read a paper entitled "It Is the Little Things That Count," which was both interesting and instructive.

There was a vocal selection by Miss Freda Feuser, accompanied by Miss Esther Roesch, on the piano, and a violin solo by Oscar Goldschmidt, accompanied by Erwin Boehme. A piano solo was given by Erwin Boehme.

L. Casper, of vice-president Fashbaugh's office, New York, and Mr. McCarty, representing the statistical department of the company, were recent visitors.

The General Telegraph Situation in England.

Our London correspondent writes: The question of staff with all cable companies began to assume a serious aspect but has been overcome by the introduction of female labor. This can of course be only a "stop-gap" measure, as the women have still to show they are up to "cable" standard, which has admittedly been for years the top of the ladder in telegraphy. At least one of the big cable companies is working a very short force, and even women are so difficult to obtain now that it has been found necessary to advertise in the daily papers, a most unusual proceeding on this side. The Marconi system continues to be monopolized by the government's business and the Pacific Cable Board is now in possession of its own cable across the Atlantic and doing an excellent service.

Everybody is finding the cost of living a very big problem, notwithstanding war bonuses. The Eastern Telegraph Company has granted its staff an additional 10 per cent. bonus for the year to be paid on December 1, and there is a whisper that the Atlantic companies have the matter under consideration. At the present the Eastern Company's war bonus is 30 per cent. plus the 10 per cent. just granted, while that of the Atlantic companies is 25 per cent. all round.

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ASSOCIATIONS AND ORGANIZATIONS.

The Old Time Telegraphers and Historical Association, W. H. Canniff, president; F. J. Scherrer, secretary, 30 Church St., New York. All Old Time Telegraphers who are eligible for membership are requested to send for application blanks. The next reunion will take place in Cleveland, Ohio, 1918, the time to be announced later.

Association of Railway Telegraph Superintendents, M. H. Clapp, president; W. L. Connelly, Gibson, Ind., secretary and treasurer.

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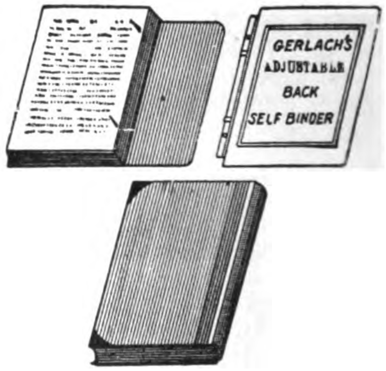

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NEW YORK, DECEMBER 16, 1917.

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Thick Weather Wireless Signals.

An important application of wireless telegraphy is now being tested by the United States Naval Communication Service, which has the promise of removing one of the greatest dangers to coast navigation during fog, mist, rain and falling snow. The tests are being made from the Point Judith lighthouse, near Newport, R. I., and warnings are given to ships in the vicinity by radiophone in a novel way. The operator at the lighthouse repeats the words "Point Judith light" every five seconds, and after every third repetition of the warning the words, "You are getting closer; keep off," are sent out. The wave length is varied continuously between 550 and 650 meters so that the warnings will reach every ship within the limit of range, which in this case is about two miles.

Wireless operators can judge to some extent the distance from the point of origin of signals by the strength with which they are received and this fact is utilized in this service. The operator on a ship, therefore, on receiving these thick-weather signals, can calculate approximately how far it is to the coast.

The Naval Communication Service cautions navigators not to place too much reliance upon the system until its worth has been proved, but on the face it certainly looks full of promise.

The Messenger Boy Problem.

The difficulty experienced by the telegraph companies in obtaining messenger boys is not a new one, although it is more acute at this time on account of the conditions resulting from the war. In looking over the files of TELEGRAPH AND TELEPHONE AGE of several years back we note that the messenger problem was then one of deep concern to the companies.

At the present time there are many and extraordinary causes for the shortage of supply of messengers, but after the war the pressure will not be so great, although it will still exist to some degree.

Carrying messages is an ever-changing occupation for boys. After a short experience they learn many things that develop their ambition, and the first opportunity that comes their way to better themselves they naturally seize. This is one of the principal reasons why the ranks of the messenger boys are difficult to keep intact.

The question of pay is not so troublesome as it used to be, but if a boy can get more money elsewhere, naturally he will leave his present employment. The telegraph companies, however, have done much to make it more attractive and pleasant for boys to remain with them, but they cannot alter the fact that this is a changing world, and that what is today is not tomorrow.

"He Started as a Telegraph Operator."

That the practical education of the average telegrapher is of the most useful and varied kind is a well known fact. He does not acquire it altogether from books, nor does it come from instruction at school; it comes from the knowledge gained through practical work at the desk. No other class of men have a greater knowledge of the world's affairs than do telegraph operators. They are quick to see and act, and their professional training gives them the rare ability to arrive at ready decisions.

Many bright and intelligent operators find their way into other lines of business where their knowledge of practical affairs becomes particularly applicable. They are fitted for almost any kind of work, and we find them in the professions, at the head of railroads, in banking and in every other branch of business where keen perception and judgment are essential.

The knowledge they acquire comes from the character of the telegraph business they handle. In one sense their positions cannot be said to become monotonous, although it is sometimes remarked that they do get "rutty." But, as a matter of fact, they cannot become permanently so because the business is of such a varied nature that, if they are at all observing, they cannot fail to learn something new from almost every message that passes through their hands. The knowledge thus acquired may not seem of any particular use in any one instance, but in the aggregate it has great worth and the day may come at any time when its value will become manifested in a practical way. This is, in a sense, a case of preparing one's self for better things unconsciously, and may be expressed by the one word "preparedness," about which we hear and read so much these days.

When we consider the possibilities of the broad training of the telegraph operator it is not to be wondered at when we read of the successful careers of many prominent men that "he started as a telegraph operator." The mere fact that he had a telegraph training gave him a foundation of practical knowledge that could hardly be obtained otherwise, and to this can be largely attributed his success in life.

Stock Quotations.

Following are the New York closing quotations of telegraph and telephone stocks on December 10:

American Tel. and Tel. Co.	103⅜
Mackay Companies	74½-79
Mackay Companies, pfd.	58-64½
Marconi Wireless Tel. Co. of Am. (Par value $5.00)	3
Western Union	78

DIVIDEND.—The Western Union Telegraph Company has declared an extra dividend of 1 per cent., in addition to the regular quarterly dividend of 1½ per cent., both payable January 15.

An Opportunity for Investment.

The present low prices for stocks offer extraordinary opportunities for investment. This publication is prepared to purchase for its friends one or more shares of Western Union, Mackay, Marconi or any other stocks, either outright or on the instalment plan. Remit $25.00 per share as the initial payment if purchase is to be made on the instalment plan. The stock will then be bought at the market price and the balance due on the stock can be paid off in any sum convenient to the purchaser. In the meantime 6 per cent. interest will be charged for the balance due on the stock. The purchaser, however, will have the benefit of the dividends, which, in many cases, will more than pay the interest charges. As soon as the stock is paid for, it will be registered in the purchaser's name and delivered to him. The commission charge on the purchase of stock is $1.00 on transactions covering from one to eight shares. For eight or more shares the commission charge is 12½ cents per share. In remitting to cover purchases of stock, name the price at which purchases are to be made.

Telegraph and Telephone Patents.

ISSUED NOVEMBER 6.

1,245,507. Telegraph System. To P. M. Rainey, New York.

1,245,575. Thermic Telephone. To P. deLange and R. A. Baron van Lynden, Utrecht, Netherlands.

1,245,650. Automatic Telephone System. To B. D. Willis, Chicago.

1,245,702. Radiotelegraphy. To E. Girardeau and J. Bethenod, Paris, France.

1,245,894. Telegraphic Receiving System. To J. M. Fell, New York.

1,245,900. Telephone Switching System. To C. L. Goodrum, New York.

1,245,929. Telephone. To F. Lacroix, New York.

ISSUED NOVEMBER 13.

1,246,065. Process for the Manufacture of Heating Elements for Thermic Telephones. To P. de Lange and R. A. van Lynden, Utrecht, Netherlands.

1,246,125. Automatic Telephone Exchange System. To A. E. Lundell, New York.

1,246,176. Machine Switching Telephone Exchange System. To A. B. Sperry, New York.

1,246,201. Telephone Toll Device and Circuits Therefor. To S. B. Williams, New York.

1,246,317. Telephone Apparatus. To S. C. Porter, Esopus, N. Y.

1,246,420. High-Power Transmitting Apparatus for Wireless Telephones. To P. J. Hackett, Seattle, Wash.

1,246,429. Microphone Transmitter. To J. E. B. Holladay, Suffolk, Va.

1,246,545 and 1,246,547. Telephone Exchange System. To H. P. Clausen, New York.

1,246,546. Telephone System. To H. P. Clausen, New York.

1,246,548. Testing Arrangement for Telephone Exchange Systems. To H. P. Clausen, New York.

1,246,551. Automatic Switch for Telegraph Receiving Systems. To C. B. Cook, Foreman, Ark.

PERSONAL.

MR. CHAS. S. LOEWENTHAL, an old-time telegrapher of Chicago, now in other lines of activity, accompanied by Mrs. Loewenthal, was a New York visitor, last week.

MR. M. A. NOSS, wire chief of the Western Union Telegraph Company at New Haven, Conn., has resigned to accept a position as assistant to Mr. Patrick B. Delany in the development of his variour electrical enterprises. Mr. Noss' headquarters will be in New York.

MR. V. D. BROWNE, of Columbus, Ohio, an electrical engineer, is now in New York in the interest of some of his inventions, which he is endeavoring to market. Mr. Browne was identified with the telegraph service for many years. Among his inventions is an alternating current sounder.

POSTAL TELEGRAPH-CABLE CO.

EXECUTIVE OFFICES.

MR. EDWARD REYNOLDS, vice-president and general manager, and Mr. W. I. Capen, vice-president, were in Albany, N. Y., last week on company business.

MR. G. W. RIBBLE, general superintendent, Atlanta, Ga., was a New York business visitor, December 11 and 12.

Mr. E. C. Platt, New York, treasurer of this company, whose son, Lieutenant E. Cuthbert Platt, was killed in action in France, as reported in our December 1 issue, has two other sons in government service. Abner Hunter Platt is a captain at Spartanburg, S. C., in command of a mounted division company. The other son, Horace Platt, is a second lieutenant in the United States Signal Corps, and is now at Camp Vail, Little Silver, N. J.

SUPERINTENDENT CHRISTOPHER F. LEONARD is receiving the congratulations of his friends upon the completion of thirty years of service with this company.

MR. M. A. MCCONNELL, of the office of Vice-President and General Manager Edward Reynolds, was married to Miss Mollie Frances Crummy, at Troy, N. Y., on November 28. The staff in the executive offices presented a substantial gift to the couple.

MR. AND MRS. JULIAN NERING, parents of Mr. John Nering, manager of this company's office at Chicago, celebrated their golden wedding recently. They were both born in Poland and came to America forty-five years ago.

SUPERINTENDENT C. A. RICHARDSON, of Albany, N. Y., was a recent executive office visitor.

MANAGERS APPOINTED. — G. T. Murray, Fort Worth, Tex., vice H. Morlan, transferred to San Antonio, Tex.; Ben Campbell, Austin, Tex., vice G. T. Murray, transferred to Fort Worth; F. Mangone, Canal Street branch, Boston; J. A. Finn, 96 Essex Street office, Boston, Mass., vice F. S. Smith, resigned; F. W. Blake, Greenfield, Mass.; G. M. Maxwell, Marquette, Mich., vice D. E. Erickson, resigned; B. H. Williams, Cotton Exchange branch, Savannah, Ga.; W. W. All, Branchville, S. C.; T. R. Irvine, Center Hill, Fla. (new office); J. F. Donovan, Boylston Street branch, Boston; Homer Hixon, Warren, Ohio; W. G. Kenyon, Station A branch, Kansas City, Mo.; A. J. Gibson, Mercer Hotel branch, Kansas City, Mo.; J. F. Jackson, Selma, Ala.; Jos. H. Embleton, Terminal Building branch, Columbus, Ohio; Wm. S. Bailey, MK branch, Los Angeles, Cal.; Miss Ione Huth, Bucyrus, Ohio.

MR. A. K. AKERS, manager of the Richmond, Va., office, has resigned to accept a position with the Alexander Hamilton Institute, of New York, which is an educational society. After undergoing a training in New York, Mr. Akers will probably make his headquarters at Charlotte, N. C.

MR. W. H. STANSELL, manager of the Wilmington, N. C., office, has been promoted to the management of the Richmond, Va., office, vice A. K. Akers, resigned.

E. S. Williams, Superintendent Cleveland Telegraph Company, Chicago.

Mr. E. S. Williams, formerly and for many years identified with the Postal Telegraph-Cable Company in an official capacity at Chicago, has been appointed superintendent of the Cleveland Telegraph Company, with headquarters in Chicago. Mr. Williams entered the service of the Baltimore and Ohio Railway Company at Oak Hill, Ohio, in 1883, and worked for that railway system for a short time, when he entered the commercial telegraph service at St. Paul, Minn., for the Western Union Telegraph Company, Mr. Victor Kissinger, now superintendent of the Burlington System, being the chief operator of the office at that time.

After a year's sojourn at St. Paul, Mr. Williams entered the service of the same company at Duluth, Minn., where he remained until 1892, going to Chicago, where he entered the service of the Postal Telegraph-Cable Company. He was soon transferred from the main office to the Board of Trade office as chief operator, and later became manager of this important branch office.

E. S. WILLIAMS.

In 1909 Mr. Williams was made manager of the Postal main offices and branches, and in 1910 he was advanced to the position of superintendent of city offices, which position he held until 1914, when he was made superintendent of an outside district, comprising Illinois, part of Missouri, and northern Indiana. On November 1 Mr. Williams was appointed to his present position, his offices being located in the Board of Trade building.

The Cleveland Telegraph Company assembles and distributes all statistics that emanate on the exchange floor and in and about the Board of Trade building that are carried on the Commercial News Department wires. The company also has a grain quotation ticker and other services used by the brokers and bankers located in the financial section of Chicago.

An outlay of $2.00 in one year is trifling, but it is a good paying investment if applied to a subscription for TELEGRAPH AND TELEPHONE AGE.

WESTERN UNION TELEGRAPH CO.

EXECUTIVE OFFICES.

MR. W. N. FASHBAUGH, vice-president in charge of traffic, visited Philadelphia, Baltimore and Washington recently on company business.

MESSRS. M. B. WYRICK, division plant superintendent, Chicago, and W. C. Titley, division plant superintendent, Denver, Col., were recent New York business visitors.

MR. A. LONG, traffic engineer, New York, has been appointed division traffic superintendent of the Mountain Division, with headquarters at Denver, Col., vice C. R. Fisher, transferred to San Francisco.

MR. C. R. FISHER, division traffic superintendent, Mountain Division, Denver, Col., has been appointed division traffic superintendent of the Pacific Division, with headquarters at San Francisco, Cal., vice Mr. B. L. Brooks, transferred, to take effect January 1, 1918.

MR. J. E. THOMPSON, of the Richmond, Va., office of this company, who last June was transferred to the Havana, Cuba, office, has returned to the States and has located in Memphis, Tenn., where he is identified with the service.

MR. PORTER E. RAMSEY, whose appointment as district plant superintendent of the Western Union Telegraph Company at Richmond, Va., was noted in our December 1 issue, was born in Jamestown, Tenn., December 15, 1883, and entered the telegraph service at Harriman, Tenn., June 10, 1900. He has been in continuous service for the same company ever since. During that time he has filled the positions of gang ground man, gang lineman, assistant foreman, utility lineman on general service, estimate clerk, chief clerk to the district plant superintendent, and for seven years prior to October 1 was district foreman of the first and third districts of the Southern Division. On October 1 he received the appointment of district plant superintendent.

THE MULTIPLEX is being installed between Toledo, Ohio, and several of the principal points in the Middle West.

Postal Telegraph-Cable Company of Texas.

HUDSON MAUD, aged fifty-six years, died at Austin, Tex., November 25. He had been identified with the telegraph service at Austin for thirty-four years, the last ten years of which he was in the service of the Postal Telegraph-Cable Company of Texas. Mr. Maud had a host of friends among the newspaper men and lawmakers of Texas, as well as in the telegraph business. He was familiarly known as "Dad" by those who knew and loved him. He is survived by his wife, six sons and two daughters, all of whom live in Austin.

MANAGERS APPOINTED.—H. E. Miller, for several years night chief operator for this company at Shreveport, La., has been appointed manager at that point. P. H. Fennell, formerly manager at Shreveport, has been appointed manager at San Antonio. Mr. Fennell began his service for this company as a messenger in the San Antonio office, eighteen years ago.

THE CABLE.

SERVICE FLAG.—The Central Cable Office, 16 Broad Street, is displaying a service flag containing thirty stars. Arthur Sterling, who has the reputation of being a first class artist, designed and executed the government service roll of honor, which is contained in a mahogany frame and hung where it will be seen by all.

A MERITED COMPLIMENT.—In a letter to the shareholders of the Central and South American Telegraph Company, and the Mexican Telegraph Company, President James A. Scrymser pays a high compliment to Mr. John L. Merrill, second vice-president of the two companies. Mr. Scrymser says: "Much of the executive and administrative work of the past three years has been performed by your Second Vice-President, Mr. John L. Merrill, and I think it only right that I should here record my appreciation of his successful work. Mr. Merrill has been closely associated with me (in the service of the two companies) for over thirty-three years, and I am pleased to make mention to the shareholders of my utmost confidence in his executive ability."

THE PRESIDENT'S MESSAGE, comprising 4,313 words, was sent direct over Western Union cables from the Central Cable Office, New York, to London, England, in two hours and three minutes without a hitch or a request to repeat. Every word reached London in splendid shape through automatic repeaters at Bay Roberts, N. F. Superintendent W. A. McAllister, of the Central Cable Office, is justly proud of this record.

CANADIAN NOTES.

MR. H. HULATT, manager of telegraphs, Grand Trunk Pacific Telegraph Company, Montreal, Que., was a recent New York business visitor.

GREAT NORTH WESTERN.

Mr. F. W. Lee, for some years past manager of the Great North Western Telegraph Company's grain exchange branch at Winnipeg, has been promoted to the position of office manager at the main office, Winnipeg. Mr. Lee is succeeded at the grain exchange branch by Mr. William Russell, who has been acting as assistant manager at that office for several years.

GRAND TRUNK PACIFIC.

Mr. H. Hulatt, manager of telegraphs, Grand Trunk and Grand Trunk Pacific Railways, has just returned to Montreal, Que., after an extended trip of inspection over Grand Trunk Pacific lines, Winnipeg and west to Prince Rupert, B. C.

The following appointments in the Grand Trunk Pacific Telegraph Company's organization have been made: J. O. Pilon, city manager, Edmonton, Alta., vice R. M. MacMillan, promoted to acting division superintendent of telegraphs (lines in Ontario, Manitoba and Saskatchewan), Winnipeg, Man.; C. A. Radford, chief operator, Edmonton; A. Vogel, city manager, Calgary, Alta., vice G. Moore, resigned; J. E. Grace, city manager, Winnipeg, vice R. M. Hicks, resigned; J. Stevens, acting city manager, Saskatoon, vice J. E. Grace, transferred. E. H. Hiscock, heretofore electrical inspector, has been promoted to electrical engineer, Central Division, with headquarters at Winnipeg, Man., reporting to the division superintendent of telegraphs.

THE TELEPHONE.

Mr. F. H. Bethell, vice-president of the New York Telephone Company, announces a general increase in the salaries of employes, instead of the payment of bonuses, which, the company asserts, do not meet the situation with respect to living conditions.

The Brantford Telephone Memorial.

The memorial which was erected in Brantford, Ont., on October 24, to commemorate the invention of the telephone by Dr. Alexander Graham Bell in that place in 1874, is one of the most impressive monuments in Canada. On the crest of a series of steps is the main portion of the monument, a huge mass of white granite. This is faced by the largest single bronze casting ever turned out. The sculptor sought to bring out, as the dominant note, the discovery by man of his power to transmit sound through space.

Above the reclining figure of Man is Inspiration, urging him on to greater endeavors, while at the other end of the panel are the floating figures of Knowledge, Joy and Sorrow, brought to man by the telephone.

At the side of the main portion of the monument are two heroic figures in bronze on granite, representing Humanity, the one being depicted in the act of sending, the other of receiving, a message over the telephone. These two figures are some distance apart, to tell in stone the power of the telephone to traverse great distances.

The memorial was erected by the Bell Telephone Memorial Association, which was organized and incorporated in Canada in 1906 for the purpose of commemorating the invention of the telephone in Brantford, and perpetuating the name of the inventor.

RADIO TELEGRAPHY.

MARCONI NOTES.

Mr. E. J. Nally, vice-president and general manager, and Mr. D. Sarnoff, commercial manager, New York, are absent on an inspection trip in the Great Lakes Division, and will return about December 20.

Mr. Herbert S. Ogden has been appointed patent attorney, with offices in the Woolworth Building.

Ten of the officials of the company attended the luncheon given by the Merchants Association of New York at the Hotel Astor, December 13. Prominent speakers discussed "The Realities of the War."

Mr. W. P. S. Hawk, of Honolulu, will continue to represent the company there during the war, while the government is operating the high power stations.

Washington to Hawaii by Wireless.—The opening of the United States Navy's high power wireless station at Pearl Harbor, Hawaiian Islands, took place recently. Messages were exchanged between Washington and Pearl Harbor, a distance of approximately 5,000 miles.

Instructors in Wireless and Buzzer Work.

At the request of the United States Army, the Federal Board for Vocational Education has undertaken to aid the army to secure the proper training of conscripted men as radio and buzzer operators (international or continental code) before they are called into service in the second and following drafts. A circular has been issued for the purpose of supplying information to school authorities who will undertake this work as a patriotic duty.

Radiophone Fog Warning Device.

A radiophone fog warning device has been installed at the Point Judith light, near Newport, R. I.

The apparatus will be of use to commanding officers in picking up the light in thick weather, as experience has shown that operators can judge to some extent the distance according to strength of signals with a known normal range. Although measurements have been taken to determine the limit of the range of this apparatus, too much reliance should not be placed in it until its worth has been proved under service conditions.

The apparatus will be in operation during fog, mist, rain and falling snow. The warning consists of the repeating of the words, "Point Judith Light," every five seconds, with limit of range of about eight miles. After every third repetition the warning, "You are getting closer; keep off," is sent out with a limit of range of about two miles.

The apparatus required for the reception of the warning signals is an ordinary radio receiver, says *The Wireless Age*. Crystal detectors may be used. The wave-length is varied continuously between 550 and 650 meters.

The system is yet in its first stages and it will doubtless be improved in the course of actual practice. The fact has been pointed out that before long every lighthouse will be shouting its name and other information so that the illumination will become of secondary importance.

Standard Insulation Resistances.

It would seem that there should be a uniform standard of insulation resistance for telegraph lines, but each company has its own standard, which differs materially from that of other companies.

The American Telephone and Telegraph Company has considered a clear weather insulation of ten megohms per mile to be satisfactory. The Western Union Telegraph Company's standard is fifty megohms per mile and that of the Postal Telegraph-Cable Company 100 megohms per mile, in clear weather. Wet weather conditions greatly reduce these figures, however. In extreme cases the insulation resistance may drop to less than one megohm per mile.

The Halifax Disaster.

On December 6 the explosion of the munition steamer "Mont Blanc" in the harbor at Halifax, N. S., which destroyed a large part of the city and caused the loss of 4,000 lives—the latest estimate—caused considerable damage to telegraph property.

Communication with Halifax was maintained by the Western Union Telegraph Company most of the time between the explosion and midnight Saturday, December 8, by means of cable from North Sydney, and part of the time by means of inland wires from Truro, though these two outlets were not maintained continuously and were entirely inadequate to handle anything but most pressing business. Communication had just about been reestablished December 7 when a blizzard set in and prostrated the company's land lines at several points near Halifax and further west, and it was not until midnight Saturday that communication was reëstablished, at which time two duplex and two quadruplex circuits were assigned. By Sunday night about 6,000 messages had been sent in to and received from Halifax, and since that time business has moved in and out with reasonable promptitude.

Assistant Traffic Manager J. J. Welch, of New York, was at Truro, N. S., shortly after the disaster occurred, and District Commercial Superintendent C. W. McKee, assisted by District Commercial Managers Farmer and McKee, Jr., reached Truro soon afterward. A large part of the file for Halifax was sent to Truro and forwarded from there by train to Halifax until wire communication was restored through the efforts of Line Supervisor Meigs, with a gang of men from the Boston plant superintendent's office.

The following traffic employes were sent from Boston to assist: W. G. Wetmore, division traffic supervisor; G. H. Batho, supervisor, and operators P. B. Beasley, J. H. Fahey, M. Lipkind, C. McNall, D. J. Shine, F. J. Fitzpatrick, R. H. Maber and F. L. Clark. Mr. Batho, with some of the operators, remained at Truro while the rest, under Mr. Wetmore, proceeded to Halifax, arriving there Sunday. The entire party was delayed nearly a day, due to trains being stalled by blizzard. Repeater Chief H. L. Flynn, assisted by W. T. Budds and C. A. Riley, were sent to St. John to assist in maintaining repeater service at that point.

The commercial department sent from the general manager's office, New York, H. Bolshaw and J. E. Armstrong and Superintendent C. F. Ames, at Boston, sent C. A. Brown from his office, assisted by S. Capabianco and I. Greenbaum, from the Boston manager's office, these men arriving Sunday. District Commercial Superintendent J. W. Reed, at Manchester, N. H., sent T. J. Kierney from Portland, Me., who arrived Monday.

The citizens of Halifax assisted the telegraph company in every way possible in meeting the emergency, and on Sunday thirty-five messengers were employed, this force being increased Monday and being assisted by the military authorities.

The Canadian Pacific Railway Company's Telegraph and the Great North Western Telegraph Company lost considerable property. While the service was interrupted for some time, the companies soon had circuits working to the stricken city. Extra forces were sent to Halifax to handle the traffic growing out of the disaster and, considering conditions, the service rendered was entirely satisfactory. The delivering of telegrams in the stricken city was the greatest problem with which the companies had to deal.

The cable steamer "Mackay-Bennett," of the Commercial Cable Company, was in the harbor at the time of the explosion, but suffered no damage, the only property damage sustained by the company being to a shed on the wharf.

Causes of Breaks in Ocean Cables.

One would naturally think that an ocean cable, buried under fathoms of water, would be out of harm's way and beyond the pale of ills of any sort, but, as a matter of fact, cables, like all material things and works of man, are subject to attack and deterioration in some way or another. Their enemies, of course, are different to those that exist on land to perplex and cause troubles, but they are none the less real, and it requires large especially built ships to patrol the seas and go to the help of cables suffering from an attack in their lonely world.

Cables are broken from various causes. Where they approach the shore they suffer from corrosion and chafe and anchors of vessels, and are occasionally broken by icebergs grounding on them and crushing them. During one repair as many as 100 icebergs were counted from a cable ship, and, to enable her to carry on her work, had to tow an iceberg to sea to take it off the line of the cables.

Cables have also been broken in the deeper waters of the Atlantic by submarine landslides, burying the cable for many miles. The Alaskan cable was broken by a whale, the decomposed carcass of which was found encircled by the cable when it was recovered during the repair. One of the cables in the southern waters was interrupted by a shark's tooth, which was found imbedded in the gutta percha. The teredo, or borer worm, has also done considerable damage to submarine cables by boring through the gutta percha insulation. But the greatest menace to the safety of submarine cables is the steam trawler. These boats operate in great numbers on the European coasts, particularly off the Irish coast. They drag the bottom of the ocean for fish down to depths of 200 fathoms or more with great iron-shod beams trailing along the bottom. They have destroyed hundreds of thousands of dollars' worth of cable property. During the year 1908 four out of five of the Commercial Cable Company's main cables were interrupted by trawlers. The company took the matter up vigorously with the British and American governments, which resulted in a conference being held in Lisbon, Portugal, to discuss the question of securing relief from these destructive operations. The British government finally appointed a commission to look into the cause of each interruption off the British coast and to take whatever steps were possible to prevent unnecessary damage to the cables.

Long Distance Telephone From Boston to Cambridge.

To talk from Boston to Cambridge by telephone is common enough these days—in fact, talking from Boston to San Francisco is common too—but in 1876 a Boston-Cambridge conversation by telephone was a great and wonderful achievement. The world, however, did not realize what it meant, apart from the mere fact—the vast possibilities that it foreshadowed.

In the intervening forty-one years the development of the telephone and its application have been marvelous, and those who labored in the early days to make something of the "mere toy" builded better than they knew.

After the birth of the telephone in 1876 it had to be taught to talk, and Dr. Alexander Graham Bell and his co-worker, Mr. Thomas A. Watson, spent many anxious days and nights in the effort to make it repeat intelligible words. They were finally rewarded, and Mr. Watson, in his story of "The Birth and Babyhood of the Telephone," tells how he and Dr. Bell succeeded in reaching Cambridge from Boston over a rusty old telegraph wire.

Progress was rapid, he says, and on October 9, 1876, we were ready to take the baby outdoors for the first time. We got permission from the Walworth Manufacturing Company to use their private wire running from Boston to Cambridge, about two miles long. I went to Cambridge that evening with one of our best telephones and waited until Bell signalled from the Boston office on the Morse sounder. Then I cut out the sounder and connected the telephone and listened. Not a murmur came through! Could it be that, although the thing worked all right in the house, it wouldn't work under practical line conditions? I knew that we were using the most complex and delicate electric current that had ever been employed for a practical purpose, and that it was extremely "intense," for Bell talked through a circuit composed of twenty or thirty human beings joined hand to hand. Could it be, I thought, that these high tension vibrations, leaking off at each insulator along the line, had vanished completely before they reached the Charles River? That fear passed through my mind as I worked over the instrument, adjusting it and tightening the wires on the binding posts, without improving matters in the least. Then the thought struck me that perhaps there was another Morse sounder in some other room. I traced the wires from the place they entered the building and, sure enough, I found a relay with a high resistance coil in the circuit. I cut it out with a piece of wire across the binding posts and rushed back to my telephone and listened. That was the trouble. Plainly as one could wish came Bell's "ahoy, ahoy." I ahoyed back and the first long distance telephone conversation began. Skeptics had been objecting that the telephone could never compete with the telegraph, as its messages would not be accurate. For this reason Bell had arranged that we should make a record of all we said and heard that night, if we succeeded in talking at all. We carried out this plan, and the entire conversation was published in parallel columns in the next morning's *Advertiser* as the latest startling scientific achievement. Infatuated with the joy of talking over an actual telegraph wire, we kept up our conversation until long after midnight. It was a very happy boy that traveled back to Boston in the small hours with the telephone under his arm done up in a newspaper. Bell had taken his record to the newspaper office and was not at the laboratory when I arrived there, but when he came in there ensued a jubilation and war dance that elicited next morning from our landlady, who wasn't at all scientific in her tastes, the remark that we'd have to vacate if we didn't make less noise nights.

Tests on still longer telegraph lines soon followed —the success of each experiment being in rather exact accordance with the condition of the poor, rusty-jointed wires we had to use. Talk about imps that baffle inventors! There was one of an especially vicious and malignant type in every unsoldered joint of the old wires. The genial Tom Doolittle hadn't even thought of his hard drawn copper wire then, with which he later eased the lot of the struggling telephone men.

Men for Aviation Work Needed by Government.

It has been said repeatedly by men who ought to know what they are talking about, that this war will be won in the air. Uncle Sam is building an air fleet that will astound the fighting world. Factories from Maine to California are working day and night on aeroplane parts. Guns and oil and gasoline and cameras and other material parts of these war machines are coming along as fast as skilled organized American factories can bring them out. Already they are being assembled, and that acme of the American get-together spirit, the Liberty motor, is being installed.

Ever since this great war started the government has been establishing aviation schools to perfect the birdmen who will be the eyes of the national army. These schools have already turned out a mighty healthy number of those fearless chaps who can climb to dizzy heights, loop the loop, spiral with the engine cut off, repair a jammed machine gun and get it into action before they reach the ground, and there are thousands more well on the road to their commissions, and they are getting into the seats of the new machines almost before the paint is dry on the initials U. S. A.

The machines and many of the fliers are taken care of, but there is a crying need for trained men to care for these machines, and those men will be forthcoming when the need is known.

Men of draft age, if these remarks reach you, reach for your hat and start for the nearest recruiting station and enlist in the aviation section of the Signal Corps. You can't enlist after December 15.

If you are 18, 19 or 20 years old, sign the blank and become a man.

If you are between 32 and 40 years of age and qualified, sign the blank and put your name where it belongs: among those who know no obligation greater than their love of country.

The First Atlantic Cable.

BY W. J. FRASER, BOSTON, MASS.

The first Atlantic cable was laid in 1858 between Valentia, Ireland, and Hearts Content, Newfoundland, and worked only 23 days, when it failed entirely. Sir William Thomson's mirror and recorder instruments were not then invented and the cable company had to rely upon its most sensitive telegraph relay. A battery power of 2,000 cells was used. Telegraph engineers in those days knew very little of the laws of electricity and their practical application, and what they did was largely guesswork. With no science and previous experience to guide them, we can understand why the high voltage of so many cells should puncture the weak spots in the insulation and finally destroyed the cable, after working just twenty-three days. It was said that the 1858 cable was improperly made and the appliances for submerging were inadequate, damaging the cable before it left the ship.

No further attempt was made to lay another cable until 1865 when the steamer "Great Eastern" was chartered for the purpose, this being the largest vessel afloat. The "Great Eastern" lost the cable several times in mid-Atlantic in her first attempt to lay it, until finally the expedition had to be given up for that year, when all her available grappling gear was lost with the cable. Sufficient experience, however, was gained to encourage the promoters to build another cable in 1866 which was laid without a hitch and the "Great Eastern" returned to mid-Atlantic from Hearts Content, N. F., picked up the 1865 cable and finished it. The length of the cable was 1,960 knots. The message rate of £20 or $100 for twenty words; cipher cost double, £40 or $200. These were the only available rates, nothing less, and when we consider what one of the companies has done in reducing these high rates, it is marvelous. A deferred cablegram can now be sent for thirty-six cents from America to Great Britain and Ireland; a cable letter to London or Liverpool of thirteen words, for seventy-five cents and a week-end letter of twenty-five words from Boston and New York for $1.15.

I remember a man came in the Liverpool office very much concerned because his wife had left him and gone to America. He wanted to stop her on arrival in New York and wrote a message of forty to fifty words. When he was informed it would cost nearly £50 ($250.), he hesitated and finally decided to let her go, as she wasn't worth it.

The Queen of England's message of about 100 words to President Buchanan in 1858, congratulating him on the connection between the two greatest English-speaking nations, occupied two days in transmission and a three-foot rule was used to measure the dots and dashes.

When Reverdy Johnson, the American Ambassador, went to England in 1866, ostensibly to settle the Alabama claims, he was banqueted at Liverpool by the Lord Mayor on arrival. John Laird, Member of Parliament for Birkenhead, who built the "Alabama," determined to be present at the dinner against all advice of his friends, and Colonel Finley Anderson, the New York *Herald* correspondent, came in the office about 10 p. m. with a short cablegram, saying: "The climax of the meeting was when John Laird was introduced to Reverdy Johnson and they both shook hands."

The New York *Herald's* correspondent in London, Colonel Anderson, to our great wonder, sent a cablegram of nearly five thousand words every evening for about six weeks, giving the news of the day, at $5.00 a word, and one day cabled the Emperor of France's speech in full.

In 1869 a French cable was laid between Brest, France, and St. Pierre, on the Island of Miquelon. In 1873 the Direct United States Cable Company was incorporated and a cable laid from Ballinskelligs Bay, Ireland, to Torbay, Nova Scotia, 2,400 knots, with a short connecting cable of 560 knots from Torbay, N. S., to Rye Beach, N. H.

The Anglo-American Cable Company, being the first to lay a cable, had the exclusive right of landing in Newfoundland, a distance of only 1,800 knots, for fifty years, which was a decided advantage in the working speed of the cables. Other cables followed—a second French cable, the Commercial Cable, and the Western Union Cable, the latter company now controlling the Anglo-American Company, the Direct Company and the original French company.

[Mr. W. J. Fraser, the author of this article, was at the time of his retirement district cable manager for the Western Union Telegraph Company at Boston, Mass., and was one of the pioneers who came to the United States to operate the Direct United States Cable. He, with four others, came to New York to work in the New York office, and was later appointed superintendent of the Rye Beach station. In 1859 he joined the British and Irish Magnetic Telegraph Company at Liverpool, directly he came from school. E. B. Bright was secretary and general manager of the company, and Sir Charles Bright, his brother, made his headquarters with him.—*Editor.*]

A Few One-Dollar Books.

OPERATORS' WIRELESS TELEGRAPH HANDBOOK. By V. H. Laughter. A complete treatise on construction and operation of wireless telegraph and telephone. Has 180 pages and 86 illustrations.

WIRELESS TELEGRAPHY AND TELEPHONY. By Alfred Powell Morgan. These systems are clearly explained; 154 pages and 156 illustrations.

THE STORY OF WIRELESS TELEGRAPHY. By A. T. Story. An interesting and instructive volume of 215 pages and 56 illustrations.

A B C OF WIRELESS TELEGRAPHY. By Edward Trevert. A simple description of wireless; 120 pages; 20 illustrations.

TELEPHONE CONSTRUCTION, INSTALLATION, WIRING, OPERATION AND MAINTENANCE. By W. H. Radcliffe and H. C. Cushing, Jr. A guide for the installation of telephone exchanges in buildings and small towns. An extremely practical book. 165 pages and 120 illustrations.

For sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

Electrolysis.

(*Continued from page 552, December 1*)

Insulating Joints.

General. The high conductivity of a cable sheath is one of the main reasons why the sheath tends to carry stray currents and thus become exposed to electrolysis. It would therefore appear that the insertion of a sufficient number of insulating joints in the sheath might so increase its electrical resistance that no appreciable current would flow, even though the adjacent earth had a considerable potential gradient. In the case of pipe systems, in which it is possible to provide very frequent breaks in the electrical continuity, insulating joints have sometimes been found very effective in mitigating electrolysis dangers, but the method has not proven to be effective as a general means for protecting cable systems.

In order to be effective, insulating joints must be placed so frequently that there will be only small differences in potential across the joints. Whenever these potential differences become appreciable, current will shunt through the earth around the joint and damage the cable on the positive side. Practically it is not desirable to break up the continuity of sheath of a main cable often enough to produce the requisite current reduction. Furthermore, the presence of insulated joints in a system increases the danger of corrosion when drainage is also used on the system. Hence it is seldom permissible to protect a cable system by both drainage and insulating joints.

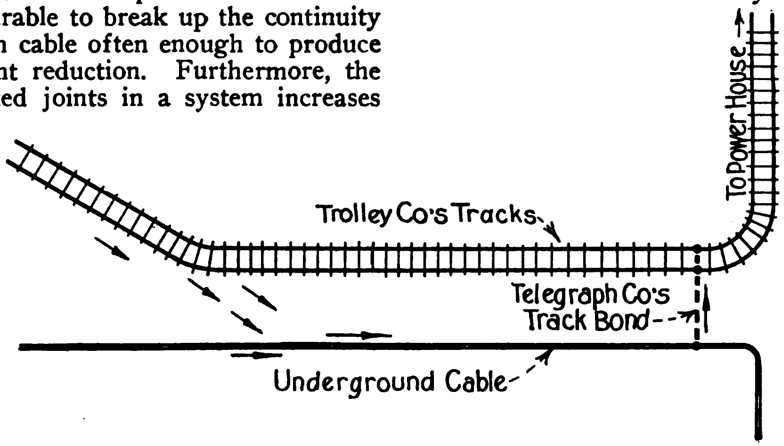

FIG. 11—CABLE PARALLELING ELECTRIC RAILWAY—WITH TRACK BOND.

If special cases should be found where the local conditions warrant a trial of insulating joints in a cable run, it should be borne in mind that high resistance of sheath is just as important in sections where the cable picks up current as where the current tends to leave, and consequently the breaks should be installed in the negative as well as the positive sections.

Insulating Joints at Bridges, etc. Although the use of insulating joints is not often practicable in main cables, there are several special conditions under which they may be installed to good advantage.

When a cable crosses or is carried on a bridge which is in more or less perfect contact with trolley tracks, and when current tends to enter the cable from such bridge structure, insulating joints may be installed on each side of the bridge, so as to interrupt the sheath continuity and prevent the current reaching the cable system as a whole. When this is done, considerable potential differences will sometimes be produced across the outer ends of the cable system, so that it may be necessary to join the ends of the cable sheath on each side of the bridge by an "insulated" wire. Of course, the introduction of current from a bridge can also be prevented by insulating the cable and ducts from the bridge structure, and this method should always be used if practicable.

Another situation where it may be found advisable to insulate a short section of sheath from the rest of a cable is where a cable crosses a trolley track and tends to pick up or drop off current. A break in the sheath a little distance each side of the track will sometimes relieve the condition considerably. Here also, however, it may be found necessary to equalize the potentials of the cable sheaths on each side by an insulated wire.

Insulating Joints in Laterals. It frequently happens that lateral cables, especially those entering buildings, come in contact with pipes or other structures which introduce a stray current to the cable system. When these contacts cannot be cleared it is desirable to prevent the flow of current into the main cable by means of a break in the continuity of the lateral sheath. Such breaks can be provided by installing an insulating joint in the lateral cable near where it joins the main cable, or, in some cases, where it leaves the building or other source of trouble. The joint should always be located so as to secure physical conditions which will best insure permanency of joint and the least danger of maintenance troubles.

EXAMPLES OF CABLE PROTECTION.

As will be evident from the discussions hereinbefore given, the most suitable method of mitigating electrolysis in any particular situation depends entirely on the conditions peculiar to that case. Hence what will be very effective in one case may be utterly worthless in another. The following examples, however, illustrate conditions which are frequently encountered, and show protective measures that may be applied to the cable in each case after it has proven impracticable to effect relief by measures applicable to the railway system.

Fig. 11 shows a cable paralleling an electric railway. If the power house is at such a distance that a return to the negative bus bar would be unreasonably expensive, and if there is no railway negative feeder available as a terminus, a track bond may be used as shown.

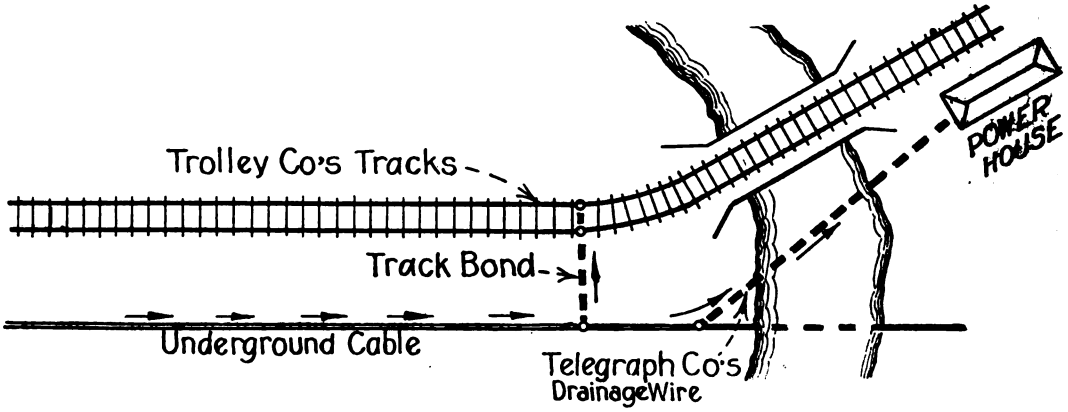

FIG. 12—TRACK BOND USED IN CONNECTION WITH DRAINAGE WIRE.

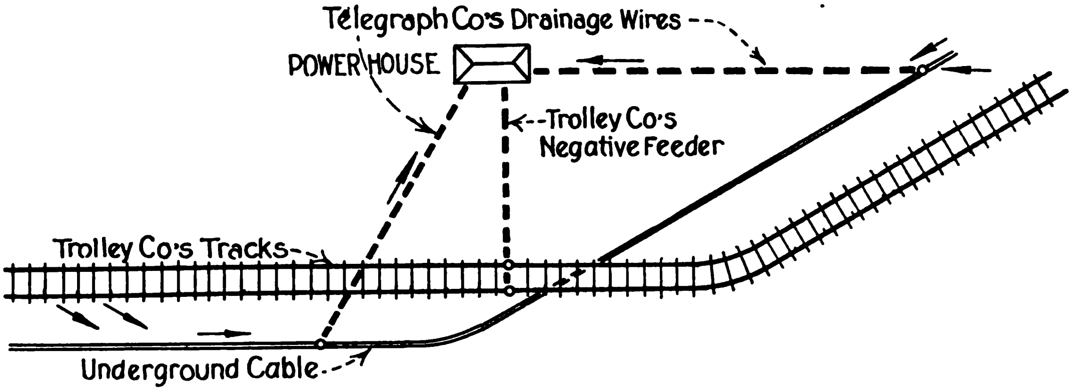

FIG. 13—CABLE WITH TWO DRAINAGE CONNECTIONS.

Fig. 12 illustrates a case in which it is assumed that the potential difference between the positive section of the cable and the negative bus bar of the power station is small. The river (whose resistance is comparable with that of the tracks) offers a parallel path to the power station. In such a case it might be advisable to install a short track bond in conjunction with a drainage wire, in order to reduce the size and, consequently, the cost of the latter. The track bond should not, however, be installed until after tests have shown that the resistance of the track between the proposed point of attachment for the bond and the power station is not high, due to defective bonding. If the track resistance should become high at any time the track bond would become an actual source of danger to the cable.

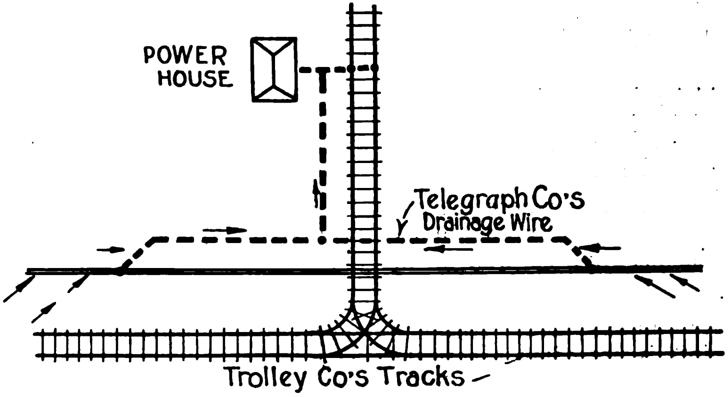

FIG. 14—DRAINAGE WIRE EXTENDED ALONG CABLE.

Figs. 13 and 14 show a positive section extending along a cable for a considerable distance. Such a condition usually exists when a power station feeds a considerable length of track in each direction. Under these conditions it may be advisable to use two drainage wires, as shown in Fig. 13, or extend one drainage wire along cable, as shown in Fig. 14.

EDUCATIONAL.

[In the preparation of the following articles on telegraphy and radio telegraphy, standard works have been freely drawn on for the substance. The questions at the end of each department are made up independently of the books consulted and are prepared to enable the student to review his work.

The books from which the material is taken are: "American Telegraphy," by Wm. Maver, Jr., "Radio Telegraphy," a publication by the United States Signal Corps, and the *Western Electric News* for the telephone information.]

Telephony.

THE HEAT COIL.

The majority of telephone wires are out of doors and above ground and, consequently, are exposed to two kinds of external electrical disturbances. Under the first class may be listed lightning and accidental contact with high voltage wires, while the second class includes excessive electric currents which may flow in the telephone wires due to accidental contact with 110-volt and 220-volt lighting wires. For the protection of telephone circuits and telephone apparatus against this latter class of foreign currents, it is usual to employ fuses and heat coils placed in the telephone exchanges and at the subscriber stations. Not only is the complicated apparatus in the telephone exchange exposed to foreign currents which may come in, but it is liable to be injured by currents which are generated by the power plants within the exchange itself. Heat coils are depended upon to give the necessary protection against these possible internal disturbances.

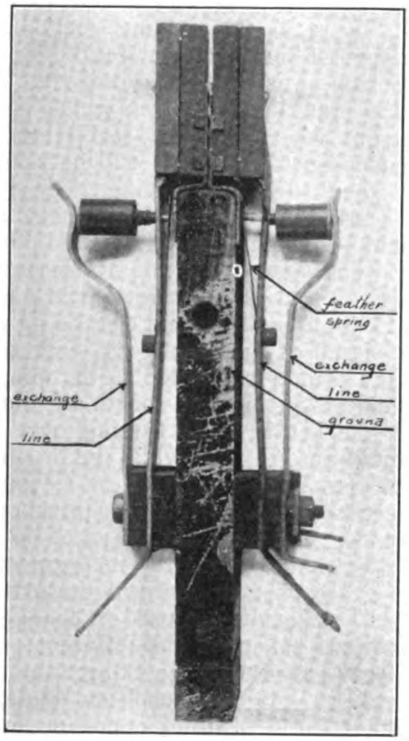

FIG. 1—HEAT COILS.

In case a lighting wire comes in contact with a telephone wire, the amount of current which will leak into the telephone circuit depends upon the voltage of the lighting circuit and on the quality of contact between the two wires. If the electrical resistance at the contact is small a relatively large current will flow into the telephone wire, thereby heating it to a point where a fire may result. When this condition prevails the fuse will blow, thereby opening the circuit and preventing a further flow of current. Conditions may be such, however, that the amount of current leaking is not sufficient to blow the fuse or to injure the telephone apparatus if its duration of flow is short. If this relatively small current continues to flow for several minutes, however, it may generate heat enough in the windings of the telephone apparatus to char the insulation and otherwise cause damage. It is the function of the heat coil to prevent this happening.

The operation of a heat coil depends upon the generation of heat due to the flow of electric current through a resistance element, and the application of this heat to a junction soldered with a metal having a low melting point. This low melting solder is an alloy of lead, tin, bismuth and cadmium, and melts at approximately 165 degrees Fahrenheit.

In Fig. 1 is shown two heat coils placed in a standard protector mounting. The coil on the left is unoperated. The path of the normal telephone current is from the subscriber's telephone wire to the line spring, thence into the copper tube, through the heat-coil winding to the brass washer, which is in contact with the exchange spring, and then to telephone apparatus in the central office. When an excessive current flows in a telephone line the winding of the heat coil becomes hot, due to the passage of the current through it, and melts the solder holding the pin and tube in their proper relation. The outside spring marked "Exchange" then pushes the heat-coil shell and pin forward, and the thin or "feather" spring on the line spring comes into contact with the ground plate, as is shown on the right of the picture. The dangerous current is thus deflected from the telephone apparatus to ground. A new heat coil must be inserted in the springs before service is renewed.

The heat coil at subscriber stations is assembled in a fibre tube with the standard subscriber station fuse. In principle it is the same as the type just described, except that the melting of the solder breaks the electrical circuit instead of deflecting current to ground. In the pull-out type of heat coil the pin is pulled completely from the tube when the solder melts, thus breaking the electrical circuit.

QUESTIONS IN TELEPHONY.

How many kinds of electrical disturbances are aerial telephone wires exposed to? Name them.

What instruments are used to protect telephone apparatus against foreign currents?

What is a heat coil, and upon what does its operation depend?

Radio Telegraphy.

The earlier types of closed circuit inductance were wound with wire or tubing, the resistance of which to direct current was very low. Both theory and experiment have shown, however, that the resistance to high frequency currents may be comparatively large. The explanation is that these high frequency currents tend to travel almost wholly on the surface of the conductor and do not penetrate to any considerable distance into the wire. Thus a thin walled tube will have practically the same resistance to high frequency currents as a solid wire of the same diameter, the inside of the wire carrying no current at all.

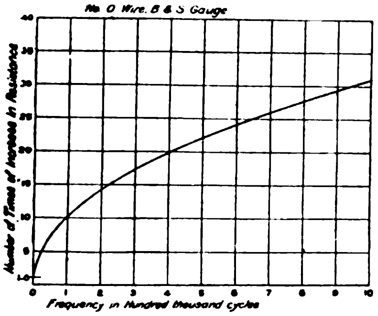

FIG. I.

This tendency of the current to flow only on the outer surface is sometimes called the "skin effect," and the distance to which the current penetrates, the thickness of the skin. The higher the frequency the more marked is the skin effect and the thinner is the skin; in other words, the higher the frequency the larger will be the resistance of the same size and length of wire. In Fig. 1 is given the curve showing the increase in resistance for No. 0 copper wire, B. & S. gauge (about 325 mils in diameter), as the frequency changes from zero, or a steady current, up to 1,000,000 cycles per second. Thus at 500,000 cycles it is seen that the resistance has been increased about twenty-two times the direct current value. The scale of such a curve will differ with the different sizes of wire, the increase being greater than here shown for wires larger than No. 0 and less for smaller sizes. In Fig. 2 is given the curve showing the increase in resistance for the various sizes of copper wire in the B. & S. gauge at a frequency of 500,000 cycles per second. Thus a wire as small as No. 35, B. & S. has very nearly the same resistance at this frequency as at a steady current, or, in other words, the thickness of the skin at this frequency is about equal to the radius of the wire. In order to be able to include all sizes of wire at all frequencies, it is evident that a large number of curves or an extensive table of resistance and frequency would be necessary.

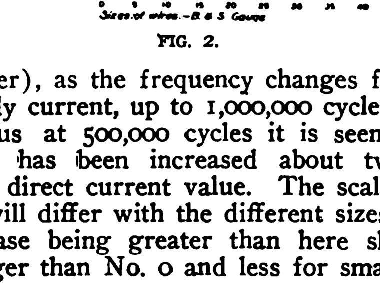

FIG. 2.

QUESTIONS IN RADIO TELEGRAPHY.

How were the earlier types of closed circuit inductance wound?

Do high frequency currents penetrate into the conductors carrying them?

When current flows on the outer surface of a conductor, what is it called?

What is the effect of change of frequency upon the "skin effect"?

The Western Union Multiplex. *(Continued)*

Fig. 3 (October 1 issue) shows the distributor face with the brushes. It will be noted that this is somewhat more complex than the diagrams which have been explained. The outside ring, 1, of this distributor is the receiving ring, only alternate segments being used for selecting purposes. The intermediate segments in each quadrant, however, are used for a specific signaling purpose, as will be described later under the Printer. The second ring from the outside, 2, is the correcting ring, and corresponds to ring R_2 of Fig. 10 (November 16 issue). The third ring, 3, is the sending ring, and corresponds to the sending ring at station Y, Fig. 10. The fourth ring, 4, is called the local ring, and performs a very important function, which will be understood from what follows. Referring back to Fig. 9 (November 1 issue), it will be remembered that while the brush is traveling over quadrants B, C and D, the combination of the levers 1, 2, 3, 4 and 5 should be changed to the combination of the next letter. Likewise, while the brush travels over quadrants C, D and A, the transmitting apparatus connected to quadrant B should change its combination to the signal of the next letter, and so on. At station X the printer connected to the quadrant A^1 receives a letter during one-fourth of the revolution, while the brush E_1 is passing over the segments of quadrant A^1; but while the brush is passing over the remaining quadrants B^1, C^1 and D^1, the printer has time to complete its printing operation, move the paper, and clear out, so as to be in readiness to receive another signal. The segments in this local ring, 4, are used to perform these functions; that is, certain segments are used to change the signal combinations set up in the different quadrants. Likewise they are used to start the printing mechanism after selection has been made, so that it may complete the printing operation in time to receive the signal for another letter. Each brush holder is insulated from the spider, and the individual brushes are made up of a number of strands of small, hard copper wires.

The motors used to drive the distributors are of the well-known phonic wheel type, and are driven by impulses from an electrically driven tuning fork. This assures a very constant rate of vibration, since the rate of a tuning fork is very constant, varying only about 1/100 of 1 per cent. per degree Centigrade, and is little affected by changes in the voltage applied to the driving magnet. The mechanical corrector which is mounted between the distributor and the motor is the mechanism which is arranged to mechanically step back the brushes when they have advanced too far, as previously explained. The speed of the motor is determined by the rate of vibration of the fork. Large changes in the rate of vibration of the fork are accomplished by adding weights to the two prongs, a set of weights being provided with each fork. Small changes in the speed of the motor (a fraction of a revolution per minute) are obtained by turning the handle at the front of the fork, which, by means of gears and a screw, moves the small fork forward or backward.

QUESTIONS ON THE MULTIPLEX.

Why are the receiving segments made shorter than the sending segments?

How are signals sent over the line?

At what time should reversals of the line current take place, and how is this provided for?

Telegraphy.

In several large telegraph offices the local circuits are now operated by current furnished by generators. In some cases where this has been done, the sounders have been wound to about forty ohms, and the machine has been designed to have a very low internal resistance, which is rendered necessary by the fact that all the sounders are connected in multiple, and hence, a very low, joint resistance of the combined external local circuits results. This will be clear upon a reference to Fig. 1, in which L B is the local generator and C the combined local circuits with the sounders S in multiple. Assuming that there may be 800 sounders in a large office. This at four ohms each would give a range in the resistance of the external circuit C of, for four ohms, when all but one of the sounders are open, to five thousandths of an ohm when all the sounders are closed. With the sounders wound to forty ohms, the lowest external resistance would be five hundredths of an ohm. The internal resistance of the generator is the resistance of the wire of its armature (or the joint resistance of its wires).

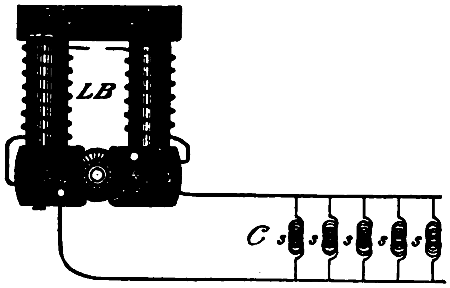

FIG. 1—CONNECTING SOUNDERS IN MULTIPLE.

Generators are also used quite extensively in large cities in the service of stock and news quotation companies. When that is the case, they are arranged in practically the same manner as in the case of the regular telegraph service.

Motor generators have come extensively into use in telegraph offices for the purpose of obtaining current for the charging of storage batteries, as well as for the operation of main and local circuits direct.

QUESTIONS IN TELEGRAPHY.

What is the resistance of sounders in large offices worked by machine current?

How are such sounders connected—in series or multiple?

Shop Talk.

BY THE OBSERVER.

Certain abuses were mentioned relative to starting motors, and also an easy way to avoid them. Now, an electric generator requires proper attention, there being little or no difference between the construction of a motor and a generator.

On the machine nameplate you will find a brass plate reading: "Capacity 3 amperes." What does that mean? It means that the safe carrying capacity of that machine is three amperes, and any more load than that would be an overload and detrimental to the life of the machine. Oh, you will say, all good machines should carry 25 or 50 per cent overload. When in doubt it is better to be safe than sorry, and if at any time it is necessary to overload a machine, watch it carefully, both as to heat, sparking and other results. If there is either excessive heating or sparking, and the sparking cannot be reduced by rocking the brushes to a new position, you had better arrange to reduce your load or expect a burned-out armature. There is not much chance for an overloaded main line generator in a telegraph office, for the simple reason there are not enough circuits to so load it, but if for any reason the proper resistance lamps or fuses were not used, one circuit alone becoming grounded or crossed would so overload the generator that it would burn out.

Now, the local machine in every telegraph office is the one that carries the larger load, and conditions require that during the month many extra taps must be made. If the sounders are of the four-ohm kind each tap will require 250 milliamperes, or one-fourth of an ampere. Therefore, for every four additional sounders you add one ampere, whereas it requires about twenty-two main lines to call for one ampere. If your local machine sparks badly, although the commutator is smooth and the brush is fitted correctly, borrow an ammeter from your power house and see what load you are taking, and if you are taking thirty amperes, whereas your machine capacity is twenty-six or twenty-eight, notify your division office, for a stitch in time will keep current on the line.

You will see the necessity for obeying instructions relative to the proper size of fuses and lamps to use, and, if in doubt, ask for guidance.

While the result is not harmful as far as the loss of human life and property is concerned, still, for proper industrial results, it is just as necessary to obey the rules relative to motors and generators as to steam boilers and steam engines.

(To be continued)

INDUSTRIAL.

Mr. G. A. Schneider, formerly of the San Francisco sales organization of the Western Electric Company, has been appointed manager of the company's Buffalo house, succeeding Mr. J. W. Tabb, who has been transferred to the New York house.

Diaphragm Sounder.—This instrument is a distinct advance in efficiency in telegraph apparatus. It effects savings in many ways, among them being the elimination of local batteries and the time-honored sounder, and it has no moving parts. It is a very durable instrument and, once it is installed, there is no cost to maintain. It is always in adjustment when the relay is, and it gives satisfaction in every way. The United States Government and the principal railways are using the diaphragm sounder with satisfactory results. For particulars address the Railways Labor-Saving Device Company, 1040 Arlington Ave., Davenport, Iowa.

Repeater With No Local Batteries.

The days of the local battery seem to be numbered, judging from the aim of inventors to find means for doing away with the battery entirely. The high cost of battery material has led to this, and, in one instance at least, success has attended the effort.

The J-C repeater of the Jester-Cooper Company, Houston, Tex., has successfully met the problem in its repeater system, which is giving satisfaction to users. This repeater is operated by the United States War Department and by the principal railroads of this country. Beside requiring no local batteries, it is simple in construction, and is very easy to keep in adjustment. These are three important advantages for any telegraph apparatus to possess.

New York Electrical School.

How the work of the New York Electrical School "takes hold" of the students is shown in a letter from one of them.

He says: "I found that after studying a chapter of a book I was then compelled to go into the workshop and construct the apparatus described. The result was that I had a practical as well as a theoretical knowledge of the work and I never can forget the thoroughness of such instruction."

This explains in few words the advantages of the method of instruction practiced by this worthy institution. It is of the most practical kind. Practical and theoretical knowledge combined is the most valuable, and the student is able to do constructive thinking as he goes along.

The headquarters of the New York Electrical School are at 43 West Seventeenth Street, New York. Any of the 5,000 New York telegraphers who are starting in life, who fail to take advantage of the facilities of this school, are losing a golden opportunity to obtain knowledge and practical experience at a minimum cost. It must be remembered that schools of this kind are not conducted in the interest of individual pocketbooks. They are organized to do good; they do good and those who neglect to take advantage of the facilities afforded are not fully equipped to fight life's difficult problems.

OBITUARY.

Erwin Mould, an operator for the Western Union Telegraph Company at Rochester, N. Y., died in that city November 28.

Walter Lockitt, aged fifty years, vice-president of the American District Telegraph Company of Brooklyn, died in Babylon, L. I., N. Y., December 3.

Mrs. Emmett Howard, wife of Emmett Howard, formerly and for many years manager of the Western Union Telegraph office at Memphis, Tenn., but who retired from active telegraph service twelve years ago, died in that city December 1.

Gold and Stock Life Insurance Association.

Mr. H. W. Dealy, secretary of the Gold and Stock Life Insurance Association, has sent a circular letter to the members notifying them of the two proposed amendments to the by-laws, effective January 1, 1918.

Section No. 7 is amended so that assessments shall be levied when necessary. Heretofore assessments could be levied not oftener than one in each quarter.

Section No. 11, as amended, provides for a total payment to all beneficiaries of $500. Heretofore some beneficiaries were entitled to receive $600.

Books for Holiday Gifts.

As the holiday season approaches, our minds are naturally directed to the subject of presents. There is nothing more appropriate and satisfactory to the recipient than a useful book, and for telegraph and telephone people—especially students—educational books along these lines are most acceptable.

Among the useful and instructive books that we recommend for presents are:

"Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students," by W. H. Jones; price $2.00 per copy.

"Correspondence School Lessons in Elementary Telegraphy," by J. H. Penman; $2.00 per copy.

"American Telegraph Practice," by Donald McNicol; price $4.00.

"American Telegraphy and Encyclopedia of the Telegraph," by Wm. Maver, Jr.; price $6.00.

"Phillips' Code," by Walter P. Phillips; price $1.00.

These are all standard and well-known telegraph books, and will make excellent presents. They are, however, just a few of the many books that can be had.

Telegraph and Telephone Age sells any electrical book published and will be glad to receive orders. We will be glad to send book catalogues to those who wish to purchase.

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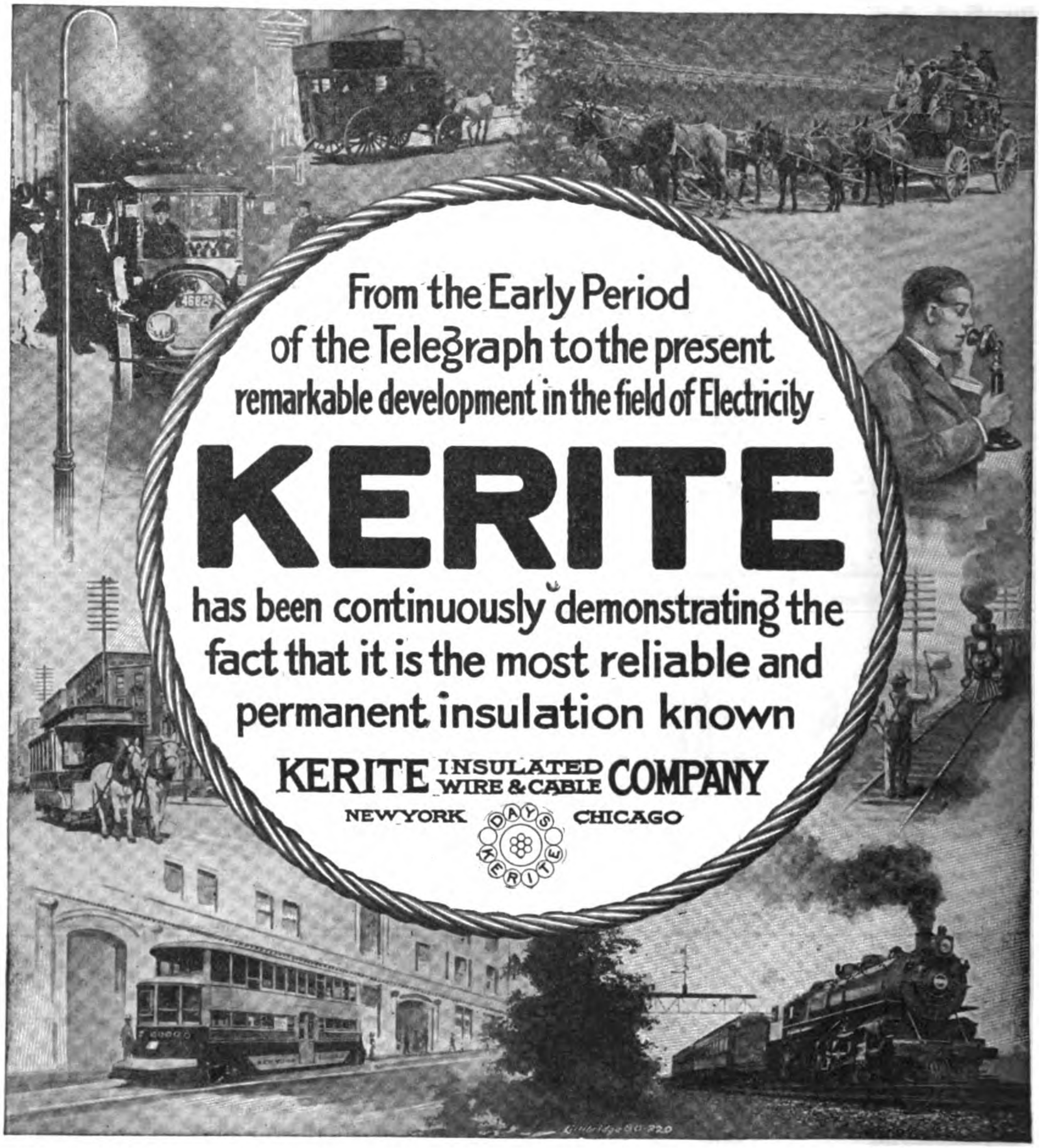
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remarkable development in the field of Electricity
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THE RAILROAD.

Cipher Codes for Railroad Business.

Reference was made in our December 1 issue to the use of cipher codes in handling railroad business by telegraph, as brought out at the special meeting in Chicago, on November 22, of the Association of Railway Telegraph Superintendents. It is evident that the use of some code system is growing in favor among railroads, and much attention is being given to the subject at this time, when conservation of telegraph service is of great importance.

In this connection it is interesting to refer to the report of Committee No. 7, Railroad Message Traffic, presented at the St. Paul convention of the Association in 1916, which shows to what extent coding was used by railroads at the time the report was made.

Fifty-one replies were received in answer to a circular letter sent to all the active members of the Association requesting information on the subject. Of these, thirty-seven reported the use of code, twenty-seven of them being special codes; nine used secret codes; eight, American Railway Association Code; three, Dempsey Code; the rest being served by fifteen other codes. On twenty-two roads all departments used code, but only seven roads used code in communicating with other railroads or business firms.

Thirty-seven roads reported in favor of small codes, three for large codes, two for large codes for commercial business, and one for large codes for secrecy. Eight roads did not favor any codes.

Of the fifty-one replies, nineteen roads were of the opinion that more time is lost in coding and decoding than is gained on wires, three of these excepting coded phrases used many times each day, and day after day, and one limiting such code to fifty phrases and sentences. The opinion was expressed by other roads that it does not take longer to code and decode than to write out in full.

Eighteen roads were of the opinion that small codes are practical and effect a saving in money, two of these limiting such benefit to large roads only.

Different roads class small codes as containing from twenty-five to five hundred words.

One road found that where telegrams are relayed once or oftener, time saved on the wires overbalances time lost in coding and decoding, but, where sent direct, coding does not pay, and thinks conditions should govern use of codes.

Opinion expressed by three roads was that codes are advisable where wires are overcrowded and use of code will avoid the necessity of providing additional facilities.

One railway's experience has been that codes seem to make but little difference in telegraph work with clear and legible copies, while poorly written code words are an abomination, causing delays and errors.

Eight roads concurred in the opinion that codes reduce the speed of service and cause more or less errors.

It was the experience of one road that codes cause delay to important telegrams, on account of persons handling them being unaware of their importance.

It has also been the experience that codes are not used when they should be, and, when used, are often improperly used.

Fourteen roads found codes practical for purpose of privacy or secrecy, and some believed that secrecy was the only excuse for coding.

Conservation on Railroad Telegraph Wires.

In commenting on the report of the special committee on the conservation of telegraphing and telephoning on railroad wires, presented at the special meeting of the Association of Railway Telegraph Superintendents, held in Chicago, November 22, the *Railway Age Gazette* says: "The censoring that has been tried, here and there, during the last twenty years has worked temporary improvement, but no manager seems to have accomplished any sweeping or radical reform, or, if any has been accomplished, it is now swallowed up in the sea of war conditions. We speak specially of the manager, for it seems quite plain that, to cut down the volume of telegraphing with appreciable and lasting effect, each general manager has got to stand, personally, very close to the man who actually uses the knife or the blue pencil."

Radio Telegraphy and Telephony on Railroads.

At the meeting of the Institute of Radio Engineers held in the Engineering Societies Building, New York, on the evening of December 5, Dr. Frederick H. Millener, research engineer, Union Pacific Railroad, Omaha, Neb., read a paper on "Radio Telegraphy and Telephony Between Movable Bodies on and Over Land" in which he gave a résumé of the research work undertaken by him for the Union Pacific road during the period of 1906 to 1916, inclusive. The purpose of the experiments was to find a method of signaling the cab of a locomotive or communicating with a train without interfering in any manner with the right of way or placing any obstruction on it. For the purpose of experiment an electric storage-battery truck made by the Westinghouse Manufacturing Company and equipped with an antenna was utilized. The first great difficulty experienced was the securing of a good ground connection.

In the early experiments the coherer was used but the telephone and detector were afterward substituted. In planning for radio telegraph stations, elevations must be taken into consideration, also static electricity.

The 60-cycle closed-core transformer, the rotary spark gap and the tinfoil condenser transmitter, then used by the Telefunken Company, was the system employed in the experiments. It was proved that it was possible to hear the high-pitched note of the stations above the strays.

Dr. Millener gave a detailed account, aided with illustrations, of the construction of the antennas.

In railroad work, he said, it is absolutely necessary to have the antennas close and compact. There is no doubt that the flat top antenna is the best and most practical for everyday use, either for railroads, or in the field.

It was found that placing the masts parallel with and close to the tracks was of great assistance in working East or West and in transmitting over the mountains, the rails seeming to assist transmission.

For short wave lengths the spark method was found to carry farthest with the least amount of energy, and for long wave lengths the arc method.

In the latest type of radiophone the positive electrodes are made of copper and the negative electrodes usually of carbon.

Radiophone generators of the arc type worked very satisfactorily over considerable distances, but they required the attention of a skilled operator.

The radio laboratory car was made over from a diner. The antenna contained twenty-one wires. A "Komet" mast (made in Germany) was provided at one end of the car in case it was desired to use the car as a telegraph office to transmit over greater distances than was possible with the antenna on the car. This mast is of the sectional type and is elevated by means of a crank and shaft. When telescoped it occupies a space six inches in diameter and eight feet high. When extended its height is eighty-two feet.

In receiving signals fair success is had at the present time, using a powerful amplifying relay, which is really a powerful telephone transmitter with associated circuits of special design.

Dr. Millener's paper was discussed by Dr. A. N. Goldsmith, D. Sarnoff and J. L. Hogan, Jr. Mr. Sarnoff summarized the experience of railroad wireless on the Lackawanna Railroad.

Railroad Telegraph and Telephone Men for Service in France.

Two battalions are now being organized in Chicago for service in the telephone and telegraph departments of the railroads now being operated by American railway regiments in France. The recruiting is being carried on under the supervision of Colonel Leonard B. Wildman, of the signal corps of the regular army. Each battalion will have the following organization: (1) One major (superintendent of telegraph); first lieutenant, adjutant (assistant superintendent and chairman of discipline board); first sergeant, acting sergeant major (chief clerk of office); three privates, attached to headquarters as orderlies and drivers (junior clerks and messengers). (2) Supply detachment—one first lieutenant, supply officer (electrical engineer in charge of supplies); one sergeant, battalion supply sergeant (supplies accountant); four privates, first class, clerks and drivers. (3) Two telegraph companies, each of which will be organized as follows: One captain (division operator); two first lieutenants (assistant division operators); two master signal electricians (one wire chief and one supervisor of signals); seven sergeants, first class (four train dispatchers, one foreman telegraph and telephone linemen and maintainers, one foreman of signals, one instructor and examiner of train rules); eleven sergeants (seven in charge of more important towers and offices; two assistant foremen telegraph and telephone linemen and maintainers; two assistant foremen of signals); seventeen corporals (nine towermen and operators, three telegraph and telephone maintainers, five signal maintainers); two cooks; one horseshoer (mechanic); forty-eight privates, first class (thirty-three telegraphers, six telegraph linemen and maintainers, eight signal maintainers, one barber); twelve privates (five telegraphers, four telegraph linemen and maintainers, three signal maintainers).

The two battalions now being organized in Chicago are headed by Major Frank W. Sherwood, for nineteen years in military service, and at one time a manager and wire chief of a Western Union Telegraph office, and by Major P. Kirk Pierce, of the Pere Marquette, Grand Rapids, Mich.—*Railway Age Gazette.*

MUNICIPAL ELECTRICIANS

WIRES UNDER GROUND IN TOLEDO.—The police and fire alarm wires in Toledo, Ohio, are being placed under ground. Mr. J. Tyler Green is superintendent of the telegraph service.

MR. ROBERT J. GASKILL, superintendent fire alarm, Fort Wayne, Ind., and past president of the International Association of Municipal Electricians, was recently appointed a lieutenant in the United States military service. He was not present at the Niagara Falls convention of the association last September on account of having entered the service, but was officially complimented for his patriotism. He was one of the association's most active and progressive workers.

New Book on Radio Communication.

"Radio Communication, Theory and Methods," is the title of a book by John Mills, of the research department of the Western Electric Company, recently brought out by the McGraw-Hill Book Company, Inc. It is the substance of a course of lectures given by the author during the summer of 1917 to a company of the United States Reserve Signal Corps troops, and while on the surface it appears highly mathematical in character, the author, in a note for the "non-mathematical reader," explains the meaning of the terminology and characters used in order to make the book more acceptable to anyone not "up" in the higher mathematics.

There are eight chapters in the book on these subjects: I—Alternating Currents; II—The Telephone Receiver; III—The Vacuum Tube; IV—Detection of High Frequency Currents; V—Production of Damped Sinusoidal Currents; VI—Production of Undamped High Frequency Currents; VII—Radio Telegraphy and Telephony; VIII—Practical Appliances and Methods of Radio Telegraphy.

An appendix deals with transmission over wire circuits, and this is followed by graded exercises.

The book contains 205 pages and 122 illustrations. Price $1.75 net. For sale by TELEGRAPH AND TELEPHONE AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

The Introduction of the Composite System of Simultaneous Telephony and Telegraphy.

An interesting account of the introduction of the Van Rysselberghe system of simultaneous telephony and telegraphy was presented by Mr. F. A. Pickernell, of the American Telephone and Telegraph Company, New York, and read by Mr. T. D. Lockwood, general patent attorney for the same company, before the convention of the Telephone Pioneers held in Atlanta, Ga., last year. The address is published in full in the printed proceedings of that meeting, and from it we abstract the following:

In the winter of 1890 Mr. D. H. Bates (former president of the Baltimore and Ohio Telegraph Company) submitted to Mr. E. J. Hall, vice-president of the American Telephone and Telegraph Company, the Van Rysselberghe system of simultaneous telephony and telegraphy. This system had previously been operated experimentally by the Baltimore and Ohio Telegraph Company on various lines and on the heavy copper circuits of the Postal Telegraph Company between New York and Chicago. Mr. Bates offered one set of apparatus for experimental use.

Mr. Hall appointed a committee consisting of Mr. T. D. Lockwood, of the American Bell Telephone Company, Mr. G. A. Hamilton, of the Western Electric Company, and Mr. F. A. Pickernell, of the American Telephone and Telegraph Company, to investigate the mechanical and electrical features of the apparatus.

The committee met and the apparatus was submitted by Mr. E. A. Leslie, representing Mr. Bates. This apparatus was enclosed in two boxes and contained the usual condensers of about two microfarads each and retardation coils of about 500 ohms each. The equipment was such as would equip one metallic circuit, and, by its means, a metallic circuit between New York and Boston, for example, would provide one talking circuit and two Morse lines. Up to this time the leased wires of the American Telephone and Telegraph Company had made use of single wires, and these wires were of no use for telephonic transmission.

The committee set the apparatus up in the office of Mr. Pickernell and put it in operation. Barring slight disturbance to the telephone, certain sluggishness in the telegraph circuit, and interference with the telephone clearing-out signals, the service was satisfactory and gave promise, in the opinion of all, of being capable of commercial development. The committee decided to turn the apparatus over to Mr. Pickernell for demonstrations under commercial conditions.

Mr. Pickernell took over the apparatus and immediately made arrangements to instal it between New York and Boston. For the period from March 14 to April 28, 1890, service was given by means of this Van Rysselberghe apparatus to several regular leased wire subscribers, and the usual telephone subscribers between New York and Boston.

The results were satisfactory and gave promise of great development. The only serious difficulty was that the clearing-out drops on the telephone circuit were inoperative, and operators had to supervise the connection by "listening in."

The matter hung fire until April, 1891, when Mr. Hall instructed Mr. Pickernell to call on Mr. Chauncey Smith, general counsel of the American Bell Telephone Company in Boston, and explain to him exactly what circuits were to be used in operating the Van Rysselberghe system of simultaneous telephony and telegraphy. Mr. Smith examined the drawings and discussed the problems involved, and finally stated that he understood the case thoroughly, and to say to Mr. Hall that the system described could be used, and that he would immediately so advise Mr. J. E. Hudson, president of the American Bell Telephone Company.

This was a very satisfactory interview to Mr. Pickernell, and, upon leaving the office, he called on Mr. A. J. Lewis, manager of the Boston office of the American Telephone and Telegraph Company. Mr. Lewis informed him that the main line between Boston and New York had been wrecked by a sleet storm the night before (April 3, 1891), and that it could not be repaired, in his opinion, in less than thirty days, and that he feared that the twenty leased wires, or most of them, would be lost before the service could be restored.

At that time the American Telephone and Telegraph Company had two lines between New York and Boston, the main line carrying forty through wires, and the shore line, newly constructed, twenty through wires. The shore line was intact. Mr. Pickernell called up Mr. E. J. Hall, at Morristown, N. J., and said to Mr. Hall that, the next day being Saturday, he was of the opinion that the shore line could be Van Rysselberghed and the leased wire service of the American Telephone and Telegraph Company reëstablished by Monday morning. He repeated the verbal report of Mr. Chauncey Smith to the effect that we were at liberty to use the system, and Mr. Hall was much interested. He said: "Mr. Pickernell, call at Mr. Hudson's office the first thing tomorrow morning and get instructions."

Mr. Pickernell called on Mr. Hudson on Saturday morning and told him the whole situation. Mr. Hudson called Mr. Chauncey Smith by telephone and, when he had finished, he said: "Pickernell, I hope you can do it, and what can I do to help you?" The only thing he could do was to have the elevator run all night. Mr. Pickernell went to the office and got in touch with Mr. A. S. Williams, his assistant in New York. One of the difficulties of the situation which now confronted him was due to the fact that nobody in the New York office was familiar with the Van Rysselberghe system, as all discussion had taken place in the committee. It was necessary to make a circuit drawing and transmit it to Mr. Williams by telephone. This was done, and the apparatus arranged for.

We made use of 600-ohm retardation coils used in the "busy test" circuit of the rebuilt Cortlandt Street (New York) switchboard, which were in stock. This was before the days of the modern condenser, and the Western Electric Company was out of stock, condensers in those days being used mostly by the telegraph companies.

Mr. Pickernell immediately got in touch with Mr.

William Marshall, a condenser manufacturer in New York. Mr. Marshall had a large shipment of condensers he was making on a rush order for the Chicago office of the Western Union Telegraph Company, but he agreed to let us have them for this emergency use. Accordingly, the apparatus was assembled, and the equipment for Boston left on the three o'clock train for Boston, Mr. G. L. Betts, chief clerk to Mr. Pickernell, taking it as extra baggage. That night and Sunday the apparatus was installed at both ends and ready for operation Monday morning. On Monday morning we started nineteen leased wires by the Van Rysselberghe system between Boston and New York, and the situation was saved. Since that time the system, vastly improved, has been in continued use and has been of great value to the company. As it became standardized, it became desirable to get a better name, and accordingly Mr. T. D. Lockwood was asked to name it. He selected what has seemed to most of us the appropriate name "Composite," and in this way it has become the designation of an important branch of the Long Lines Department of the American Telephone and Telegraph Company.

Efficiency Engineering in the Telegraph Service.

(Continued from page 541, December 1)

A customer recently wrote us that for over twenty-five years he had been dealing with Telegraph and Telephone Age, forwarding many orders for electrical books and subscriptions each month, and during all that long period his orders had been filled promptly and satisfaction always resulted. He was surprised to learn that business transactions should be effected for so many years without a dispute of any kind arising.

Our answer to this is that it is only a question of efficiency. Our friend could have gone farther and stated that during the thirty-five years of the paper's existence we have never had a dispute with anyone growing out of business transactions with this publication. We have always conducted the paper on business efficiency, and that is the only explanation that can be made or that need be made. We realize that when a customer orders a book or a subscription he wishes his order to receive prompt and careful attention. He wishes the book he orders and he wants it promptly. He gets it. This publication has been issued on schedule time since its establishment, which is efficiency in another form. The object in the conduct of any business, whether large or small, should be at all times to do the greatest good to the greatest number.

All businesses should be conducted on scientific principles. In these days, when the demands of the war are great, it becomes necessary to study how to perform the same amount of labor with fewer hands. First of all, the demands of the war must be met. At the same time the government and the community at large look to the telegraph, the telephone and the railroads for an efficient service. It is often a perplexing problem how to meet the wishes of the government and to transact the business of the public without friction, confusion or delay. There is always a way to satisfy every demand that is reasonable, and those in charge of these important agencies must evolve a simple method of procedure. Simplification of methods is one of the means used in these days to effect savings in details and labor. Every manager and every chief operator of every telegraph office should study the problems that confront him with the object of solving them with less labor than it formerly required.

We are told that men, or lack of men, is the biggest problem that confronts this nation today. Where to let men go and where to keep them is a part of a programme that confronts everyone. A chief operator one day congratulated himself that his force was in excellent working condition, all pulling together in the interests of the company. A week later over thirty vacancies had to be filled. Stop and think a minute what this means! Every one of the thirty people required must be expert in his own line, and skilled help to fill the vacancies had to be found. The official could not go to the general manager of the company and say that he could not find the necessary help. To do so would be an admission of his shortcomings, and a change would result. He had to rearrange and readjust his force to meet the situation that confronted him.

Did he solve the problem satisfactorily to the company and the public? If he was a man of resourcefulness his troubles were lessened in the first place by a determination to win out. He had always taken the precaution to train understudies to fill the various positions. The result of this careful training manifested itself favorably when thirty-odd vacancies had to be filled. Business could not be stopped while people were being trained. In this emergency the force was readjusted; ten to fifteen night men were brought on days to help out and a similar number of the day force was assigned to duty at night to aid, with the astonishing result that, in an office where the total number of employes was less than one hundred, the gap occasioned by the unusual number of vacancies was bridged over successfully for fully three weeks.

This is a concrete case, and it proves that the skillful management of those in charge is all that is required to overcome the trials and tribulations that have occurred and will occur probably many times in all telegraph and telephone offices during the continuance of the war.

(To be continued)

Mr. T. Ahearn, president of the Ottawa Electric Company, Ottawa, Ont., and one of the most prominent citizens of Canada, in remitting to cover his subscription for another year, writes: "I congratulate you upon the thirty-fifth anniversary of the publication of the Age. I trust you may be long spared to preside over its destinies. I enjoy reading about the telegraph and telegraphers, and find occasionally something about an old-timer whom I knew when I worked as an operator at 145 Broadway, New York, and, four years later, in the then wonderful building, old 195 Broadway."

A Reminder.—I must subscribe for Telgraph and Telephone Age today.

STATISTICAL INFORMATION REGARDING TELEPHONE TRAIN-DISPATCHING AND PRINTING TELEGRAPH SYSTEMS ON RAILROADS IN THE UNITED STATES AND CANADA, CORRECTED TO NOVEMBER 1, 1917.

NAME OF RAILROAD	Name of Superintendent of telegraph	Total mileage	TELEPHONE	TELEGRAPH	Do you use a printing telegraph system? If so, which one?	How many miles of printing telegraph circuits have you in operation?
			Total mileage operated by telephone	Total mileage operated by telegraph		
Atchison, Topeka & Santa Fe	H. C. Chace	11,395	6,891	4,504	No	None
Atlantic Coast Line	W. P. Cline	4,916	1,135	2,989	No	None
Baltimore & Ohio	C. Selden	4,878	1,979	2,899	No	None
Bessemer & Lake Erie	F. W. Smith	206	206	0	No	None
Boston & Maine[2]	C. C. Bedloe	2,302	337	1,965	——	——
Canadian Pacific[3]	J. McMillan (Manager Telegraphs)	14,184	6,121	7,710	Morkrum	7,154
Chicago & Northwestern	Wm. Bennett	8,360	2,294	5,498	No	None
Chicago, Burlington & Quincy	V. T. Kissinger	9,364	3,853	5,411	Morkrum	659
Chicago Great Western	G. O. Perkins	1,496	665	831	No	None
Central Vermont	M. Magiff	526	362	163	No	None
Central of Georgia	G. L. Candler	1,915	660	1,255	No	None
Chi., St. Paul, Minn. & Omaha	G. Boyce	1,753	0	1,753	No	None
Chesapeake & Ohio Railway Company, Chesapeake & Ohio Railway Company of Indiana, Chesapeake & Ohio Northern Railway Company	C. W. Bradley	2,371	1,727	289	No	None
Chicago, Rock Island & Pacific	G. D. Hood	8,330	2,218	5,541	No	None
Chicago & Eastern Illinois[2]	C. McCormack	1,282	218	1,064	——	——
Central Railroad of New Jersey and N. Y. & Long Branch Railroad	F. G. Sherman	676	181	501	No	None
Chicago, Milwaukee & St. Paul	E. A. Patterson	10,210	3,948	6,262	No	None
Chi., Terre Haute & Southeastern	F. H. Van Etten	365	171	194	No	None
Cleveland, Cincinnati, Chicago & St. Louis and Cincinnati Northern	C. S. Rhoads	2,508	1,959	548	No	None
Colorado & Southern	J. L. Henritzy	1,965	0	1,965	No	None
Denver & Rio Grande	J. M. Walker	2,902	834	1,500	No	None
Denver & Salt Lake	C. A. Parker	254	214	254	No	None
Delaware, Lackawanna & Western	L. B. Foley	981	981	0	American Telegraph Typewriter	150
Erie	E. P. Griffith	2,227	1,260	967	No	None
Grand Trunk Railway System	H. Hulatt	4,779	2,169	2,610	No	None
Grand Trunk Pacific Railway	H. Hulatt	3,115	2,946	169	No	None
Great Northern[2]	J. C. Rankine	8,077	5,097	2,979	No	None
Gulf Coast Lines	J. W. Wood	985	372	632	No	None
Ill. Central, North of Ohio River	F. T. Wilbur	6,050	3,057	2,993	No	None
Ill. Central, South of Ohio River	B. Weeks					
Indiana Harbor Belt[2]	W. L. Connelly	45	45	0		
Kansas City Southern	R. L. Logan	1,292	0	1,292	No	None
Lake Erie & Western	R. F. Finley	871	570	0	No	None
Long Island	L. S. Wells	397	377	19	No	None
Los Angeles & Salt Lake	C. J. Steinel	1,115	0	1,115	No	None
Lehigh Valley	J. F. Caskey	1,443	1,265	178	No	None
Louisville & Nashville	R. R. Hobbs	5,070	3,221	1,397	No	None
Maine Central[2]		1,362	0	1,362	——	——
Michigan Central	J. J. Ross	1,761	1,472	62	No	None
Missouri Pacific[5]	E. A. Chenery	7,295	2,082	5,213	No	None
Missouri, Kansas & Texas	W. H. Hall	3,788	1,759	2,029	Morkrum	381
Minne., St. Paul & Sault Ste. Marie	H. A. Tuttle	4,228	582	3,646	No	None
Minne., St. Paul & Sault Ste. Marie (Chicago Division)	P. W. Drew		462	560	No	None
New York, New Haven & Hartford	N. E. Smith	2,000	583	1,500	No	None
Norfolk Southern[2]		907	751	146	——	
Norfolk & Western[2]	G. W. Jett	2,036	1,777	75	——	
Northern Pacific	M. H. Clapp	6,534	2,836	3,698	No	None
N. Y. Cen. R. R., East of Buffalo	A. B. Taylor	2,867	2,740	126	American and Morkrum	570
N. Y. Cen. R. R., West of Buffalo	R. F. Finley	2,064	2,064	None	Morkrum	113
New York, Chicago & St. Louis	W. L. Blair	511	511	0	No	None
Oregon Short Line[2]	M. H. Brown	2,148	263	1,896	——	——
Ore., Wash. R. R. & Navigation Co.	E. A. Klippel	2,052	819	1,232	——	——
Penna., East of Pittsburgh & Erie[4]	J. C. Johnson	5,378	5,228	150	See Footnote	585
Penna., Lines West of Pittsburgh	G. A. Cellar	4,983	1,828	3,086	Morkrum	1,129
Peoria & Eastern[2]	C. S. Rhoads	337	337	——	——	——
Pittsburgh & Lake Erie[1]	L. A. Lee	225	225	——	——	——

NAME OF RAILROAD	Name of Superintendent of telegraph	Total mileage	TELEPHONE	TELEGRAPH	Do you use a printing telegraph system? If so, which one?	How many miles of printing telegraph circuits have you in operation?
			Total mileage operated by telephone	Total mileage operated by telegraph		
Pere Marquette	G. W. Trout	2,249	916	1,334	No	None
Pittsburgh, Shawmut & Northern	C. L. Lathrop	180	86	94	No	None
Philadelphia & Reading	L. D. Shearer	2,325	55	2,270	No	None
Richmond, Fredericksburg & Potomac and Washington Southern	T. R. Gooch	119	119	0	No	None
Southern Pacific (Pacific System)	E. L. King	7,104	1,696	5,870	Morkrum	1,266
Seaboard Air Line Railway Co.	W. F. Williams	3,461	2,009	1,452	No	None
Southern Ry. System, Lines East	J. A. Jones	4,465	421	4,044	No	None
Southern Ry. System, Lines West	W. S. Melton	3,900	630	2,270	No	None
St. Louis & San Francisco[1]	H. D. Teed	4,728	1,765	2,827		
St. Louis & South Western	W. J. Williams	1,753	425	1,328	No	None
Temiskaming & Northern Ontario Railway Commission	W. T. Kelly	330	285	43	No	None
Texas & Pacific	F. Tremble	1,952	524	1,328	No	None
Terminal R. R. Assn. of St. Louis	F. E. Bentley	14	0	14	—	—
Toledo & Ohio Central[3]	B. J. Schwendt	399	399	0	—	—
Union Pacific	P. F. Frenzer	3,622	722	2,900	Morkrum	492
Wabash	J. P. Church	2,515	830	1,695	No	None
Zanesville & Western[2]	B. J. Schwendt	85	0	85	—	—
Totals		213,976	94,625	115,223		12,499

[1] Figures of 1916. [2] Figures of 1915. [3] Figures of 1914.

[4] The Pennsylvania Railroad Company now has two installations in operation and has arranged for several other circuits which will be placed in service in the near future. The Wright printer is now operated from Philadelphia to Pittsburgh, a distance of 350 miles; and the Morkrum printer from Philadelphia to Altoona, a distance of 235 miles.

[5] The figures of the Missouri Pacific include 334 miles of jointly operated track owned by other companies, 28 miles of which are dispatched by telegraph and 306 miles by telephone.

[6] Printers on the Canadian Pacific have been installed since the report of 1915.

Anniversary Congratulations.

Congratulations on the thirty-fifth anniversary of this paper's existence continue to reach us from all sections of the world. It is a great satisfaction to the proprietors to know that the paper and the efforts of the publisher during so many years are appreciated. The expressions of good will and encouragement are a great stimulus and will be a large influence in the effort to further improve the paper during the years to come.

We give below the names of many of our friends from whom congratulations have recently been received:

W. T. Plummer, Chicago, Ill.; A. L. Tinker, agent, Gamewell Fire Alarm Telegraph Company, New York, and son of the late Chas. A. Tinker; John F. Cleverdon, of the electrical engineer's office, Postal Telegraph-Cable Company, New York; Allan Woodle, district commercial superintendent, Western Union Telegraph Company, Buffalo, N. Y.; W. J. Maguire, manager, Postal Telegraph-Cable Company's office, Chamber of Commerce, Boston, Mass.; B. E. Sunny, president Chicago Telephone Company, Chicago; P. Zachares, manager, Postal Telegraph-Cable Company, Yonkers, N. Y.; A. J. Coppin, Western Union Telegraph cable office, Halifax, N. S., Canada; C. E. Beach, consulting engineer, Binghamton, N. Y.; A. H. Bannerman, assistant superintendent, Halifax, N. S., Canada; John A. McIntyre, St. Louis, Mo.; C. J. Hoyt, manager, Western Union Telegraph Company, North Sydney, N. S., Canada; S. D. Barger, Alhambra, Cal.; W. Harry McKeldin, chief operator, Western Union Telegraph Company, Washington, D. C.; Frank N. Dowler, general eastern agent, Colorado Midland Railroad, with headquarters in New York; C. F. Annett, manager, Western Union Telegraph Company, Richmond, Cal.; D. McNicol, assistant electrical engineer, Postal Telegraph-Cable Company, New York; L. D. Firman, Philadelphia, Pa.; G. D. Butler, formerly manager of the Western Union Telegraph Company, Rochester, N. Y., now retired; C. H. Ashburn, superintendent, Postal Telegraph-Cable Company, Richmond, Va.; W. E. Heady, an old-time telegrapher, now an official stenographer, New York; C. A. Richardson, superintendent, Postal Telegraph-Cable Company, Albany, N. Y.; W. C. Hirchert, Salamanca, N. Y.; Minor M. Davis, electrical engineer, Postal Telegraph-Cable Company, New York; Ashbel Green, a former old-time telegrapher, for the past twenty-five years identified with the Stock Exchange, New York; A. E. Stewart, Western Union Telegraph Company, Greensboro, N. C.; J. L. Edwards, identified with the Western Union service in New York since the early fifties, now living in retirement at Collingswood, N. J.; G. W. E. Atkins, vice-president, Western Union Telegraph Company, New York; Frank Kitton, of Vice-President Yorke's office, Western Union Telegraph Company, New York; S. M. English, general manager, Western Union Telegraph Company, Dallas, Tex.; C. E. Bagley, superintendent, Postal Telegraph-Cable Company, Philadelphia, Pa.; Geo. Heldorfer, Burlington, Iowa; G. E. Paine, formerly general superintendent of the Postal Telegraph-Cable Company at Atlanta, now in the insurance business at Macon, Ga.; Mr. Gardner Irving, general superintendent, Commercial News Department, Western Union Telegraph Company, New York.

The New Censorship Board.

Members of the new censorship board authorized by the Trading with the Enemy act have been appointed by the Post Office Department and the Committee on Public Information. Its duties have to do with the censorship of wireless as well as other means of communication. The members are Robert L. Maddox, superintendent of foreign mails, and Edgard Sisson, head of the visé division of the information committee. Major General McIntyre and Lieutenant Commander Belknap, representing respectively the War and Navy Departments, have also been appointed members of the Board.

Meeting of Serial Building Loan and Savings Institution.

A meeting of the shareholders of the Serial Building Loan and Savings Institution will be held at 195 Broadway, New York, on Tuesday, December 18, at 5 p. m., for the purpose of nominating officers and directors.

The annual meeting of the shareholders will be held at the same place at 5 p. m., Tuesday, January 15, 1918. Polls for the election will be open from 2 p. m. to 5 p. m.

Books.

CABLE TESTING.—An excellent book for cable operators is "Beginners' Manual of Submarine Cable Testing and Working," by G. M. Baines. The author is a practical cable man, and has written his book in clear language for the benefit of beginners and students. It is also of value to cable electricians. The price is $3.50 per copy. For sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

CABLE CODES.—TELEGRAPH AND TELEPHONE AGE is headquarters for all cable cipher codes. Telegraph managers would do well to bear this fact in mind when customers make inquiries regarding such codes. We are prepared to furnish full information on the subject, our knowledge being based on thirty-five years' experience in handling the hundreds of codes on the market.

PHILLIPS' CODE.—No progressive telegrapher should be without a copy of Phillips' Code, which is a time tried system of telegraphic shorthand. It is used very extensively in the United States by all press associations and telegraph operators, and a knowledge of the abbreviations, which is very easy to acquire, enables one to report the proceedings of meetings, speeches, etc., besides its use on the wire. Price $1.00 per copy. For sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

TWENTIETH CENTURY MANUAL OF RAILWAY, COMMERCIAL AND WIRELESS TELEGRAPHY is the title of a practical book for railroad telegraph men and dispatchers, by F. L. Meyer. Every branch of the service has been handled in a practical and masterly manner, and the information given is the result of wide observation and experience. It is a complete education in railroad telegraphy, from first principles to the finished operator who can be relied upon to do things in emergencies. It has a chapter on wireless telegraphy. Price $1.00. For sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

EASY LESSONS IN TELEGRAPHY.—The best book on telegraph instruction is "Correspondence School Lessons in Technical Telegraphy," by J. H. Penman. It is a school in itself and teaches the rudiments of practical telegraphy in easy lessons. Test questions are given at the end of each chapter to enable the student to review his work and progress at intervals. The book has 197 pages and is freely illustrated with diagrams. It is up to date, too. The price is $2.00 per copy. For sale by TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York.

OUR SERVICE BUREAU.—Anyone residing outside of New York City who desires expert information on any subject, or any service, can have his wants attended to by addressing TELEGRAPH AND TELEPHONE AGE, 253 Broadway, New York. A charge of $1.00 per hour will be made for such service.

ELECTRICAL MEASUREMENTS AND METER TESTING is a plainly written book, by D. P. Moreton, suitable alike for the student and the practical man. Price $1.00 per copy. For sale by TELEGRAPH AND TELEGRAPH AGE, J. B. Taltavall, publisher, 253 Broadway, New York.

LETTERS FROM OUR AGENTS.

New York Postal.

T. J. Sullivan, aged seventy-four years, a former operator for the Postal Telegraph-Cable Company, New York, died in Brooklyn, N. Y., December 6. Mr. Sullivan held many important telegraph positions during the past fifty years of service in New York. It will be remembered that in the issue of TELEGRAPH AND TELEPHONE AGE dated August 16 Mr. Horace L. Hotchkiss, in his interesting article on "The Stock Ticker," had this to say: "The development of the Gold and Stock Telegraph Company has greatly depended upon the ability and character of its working force. One of its most valued employes was Timothy J. Sullivan, who operated by hand the transmitter during several years preceding the introduction of the present automatic mechanism." He was a brother of John F. Sullivan, another old-time telegrapher, now retired.

Great Luck of a Telegrapher.

Mr. D. A. Mahoney, the well known New York telegrapher, is the recipient of many congratulations on his good fortune in winning a three and one-half pound package of sugar at a church fair on one chance, which cost him five cents.

Associated Press Operators in Signal Corps.

Up to December 1 sixty Associated Press operators had enlisted for service in the army, particularly in the Signal Corps.

New York Western Union.

On vacations: E. T. Burrill, chief of force, being relieved by A. M. Lewis, assistant chief operator, who is in turn relieved by H. F. Pearce, supervisor.

Three of the employes of the Commercial News Department have recently joined the Naval Reserves: namely, S. E. Moyer, B. Applebaum and J. L. Temple. The distribution center has also furnished Walter T. Hushen and John J. Lawlor for Naval Reserve work, and these men are stationed at the censor's office, 20 Broad Street. The list of those having entered government service from this department contains the names of 173 employes, and almost daily additional names are beind made to the list.

T. A. Boyle, a well known New York telegrapher many years ago, was a visitor in this city last week. Mr. Boyle's home is now in Savannah, Ga.

The telegraph minstrel show gave its initial entertainment of the season on December 14, which was the date of going to press with this issue. Your correspondent, however, feels assured that it will be a splendid success from every point of view. The fact that it was given under the auspices of the Western Union Educational Society, the president of which organization is G. E: Palmer, is sufficient evidence to always insure snappy and entertaining work on the part of all participants.

W. E. Peirce, one of the veterans of the office, is spending two weeks at his old home in Washington, D. C.

Philadelphia Postal.

Mrs. Gertrude Kramer, formerly Miss Gertrude McCorkel, previously employed in this office, and one of the fastest printer operators on the Philadelphia-New York printer circuit, died on December 3, after an illness of three weeks. Many telegraph friends attended her funeral. A large floral tribute from the operating department was presented, and a committee of six acted as pallbearers. Wm. T. McCorkel, who is employed in this office, has the sympathy of his friends in his sad loss.

A New Supply of Rubber Telegraph Key Knobs Now Ready.

No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fit snugly over the hard rubber key knob, forming an air cushion. They render the touch smooth and the manipulation of the key much easier. A new stock, made December 15, is now ready for delivery. Price twenty cents each, or six for $1.00. Address orders to J. B. Taltavall, publisher, TELEGRAPH AND TELEGRAPH AGE, 253 Broadway, New York.

J. S. Ellis, of New York, assistant superintendent of construction, was among recent visitors.

Chicago Western Union.

Fred Kent, one of the old-timers of the Chicago office and at one time prominently identified with the Overland Division when it required expert telegraphers to work those long circuits, died November 20.

Fred. Phelps, son of Night Wire Chief C. J. Phelps, died November 27.

E. W. Mayfield, aged sixty-two years, a well known telegrapher in the Middle West, having worked in the Chicago, St. Louis, Omaha and other offices of this company, died in Chicago October 5. At the time of his death Mr. Mayfield was superintendent of the Cleveland Telegraph Company.

Omaha Western Union.

J. B. Pemberton, assistant manager at Omaha, has been made district manager under Superintendent Davis, and his territory covers Nebraska.

Charles W. Allen, manager of the Grain Exchange office in this city, died suddenly November 7. He was in the continuous service of the Western Union Company for more than thirty years.

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This busy world needs practical men, not theorists. The men occupying the highest and most influential positions in business today are truly practical men.

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The New York Electrical School fits men to become masters in the electrical trade, and the instruction and knowledge thus acquired leads them to higher ambitions. The way to learn the electrical trades is by doing the actual work systematically, and this is the method followed by the New York Electrical School.

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NOTICE TO READER—When you finish reading this magazine and do not wish to retain it, place a 1-cent stamp on this notice, hand same to any postal employe and it will be placed in the hands of our soldiers or sailors at the front. No wrapping—no address.
A. S. BURLESON, Postmaster General.

Telegraph and Telephone Age

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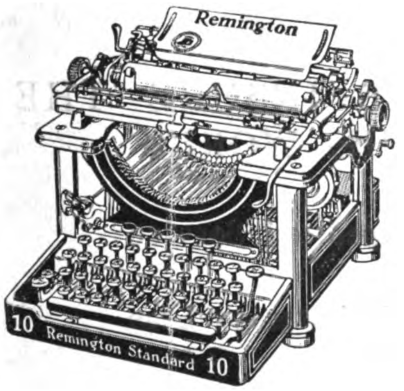

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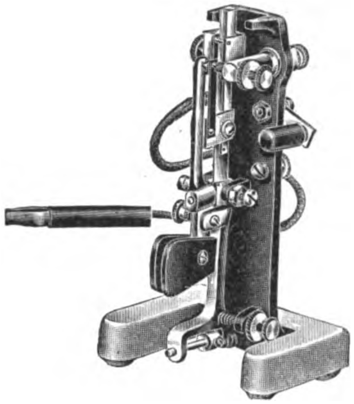

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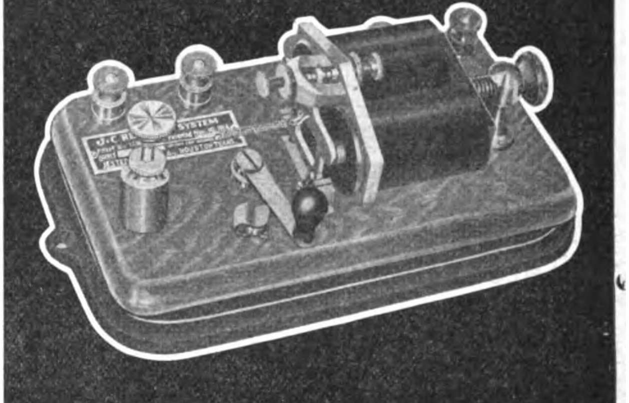

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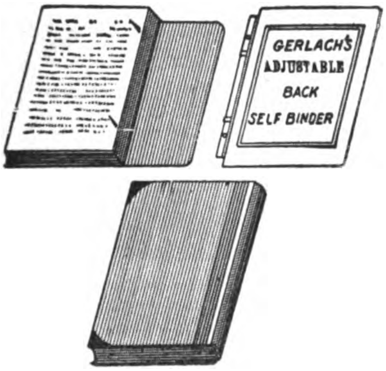

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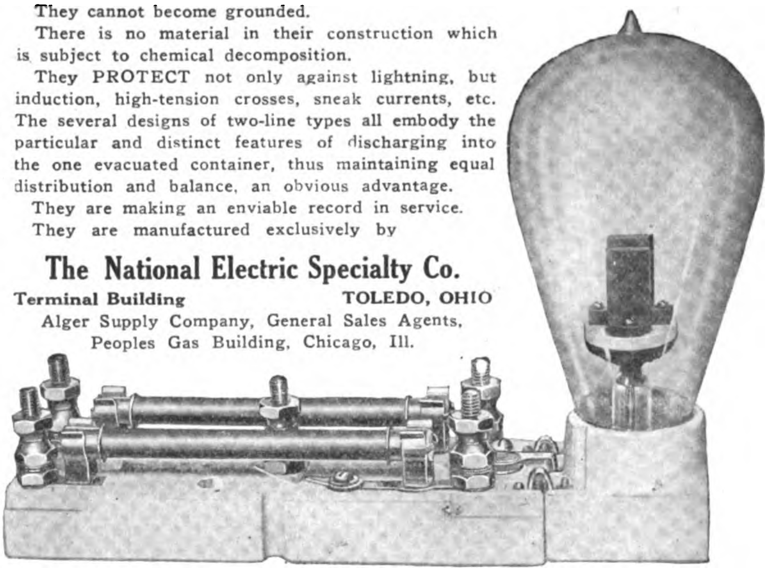

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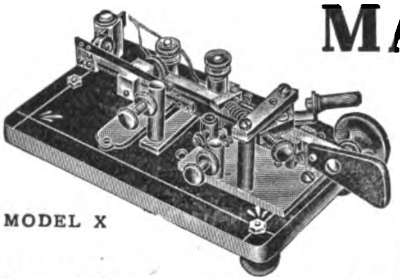

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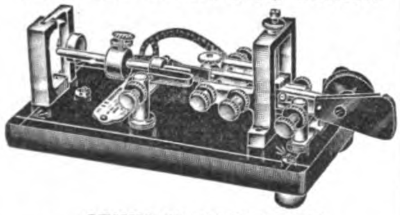

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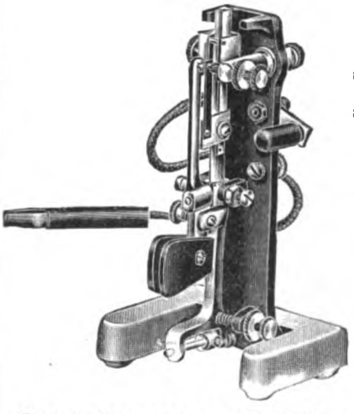

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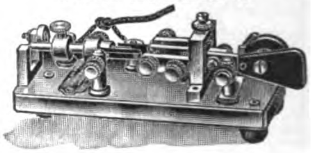

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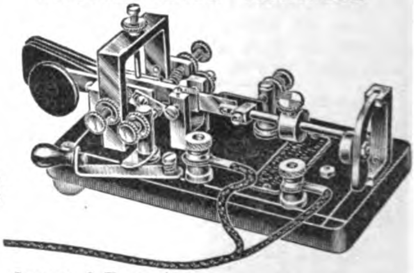

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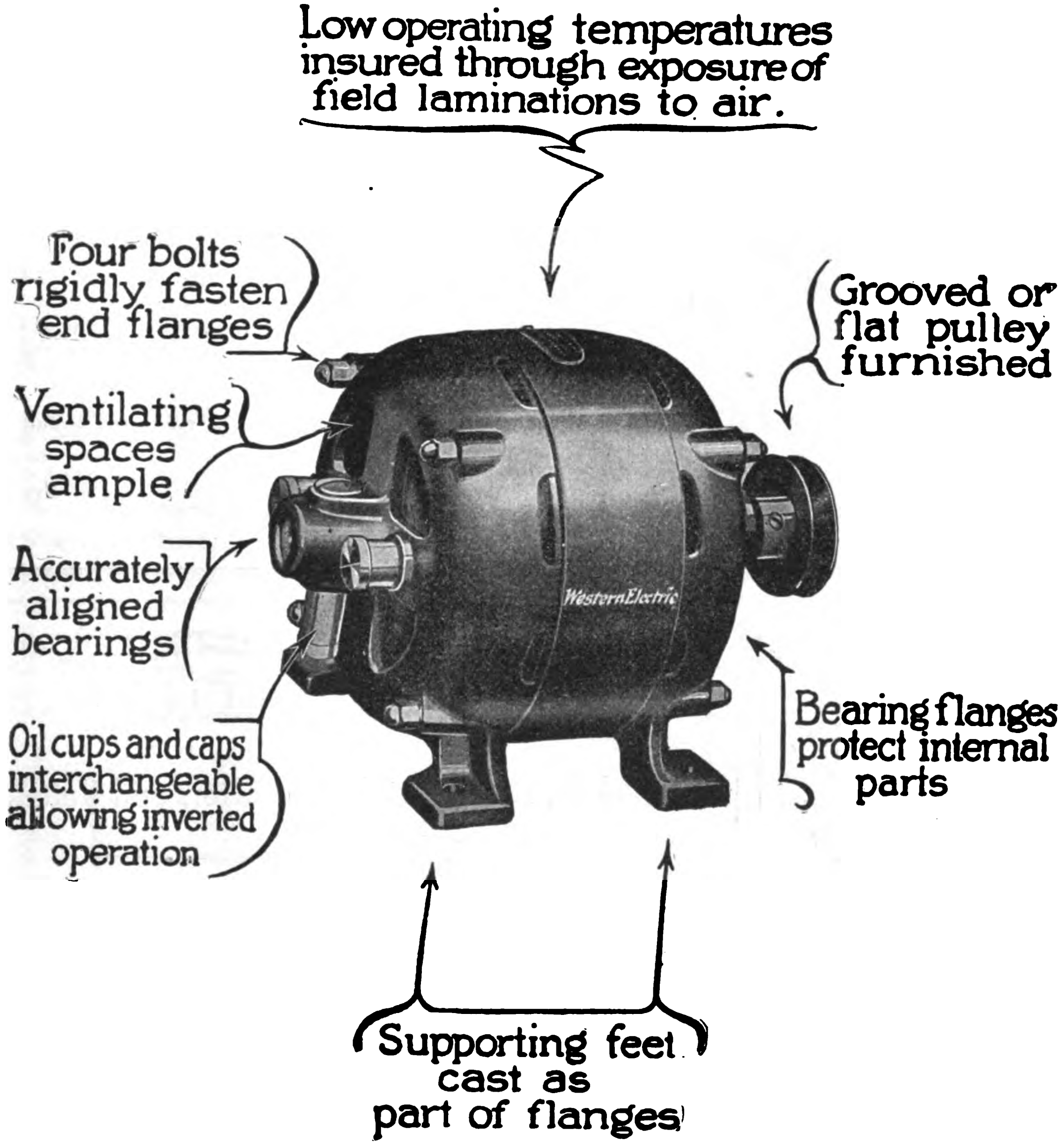
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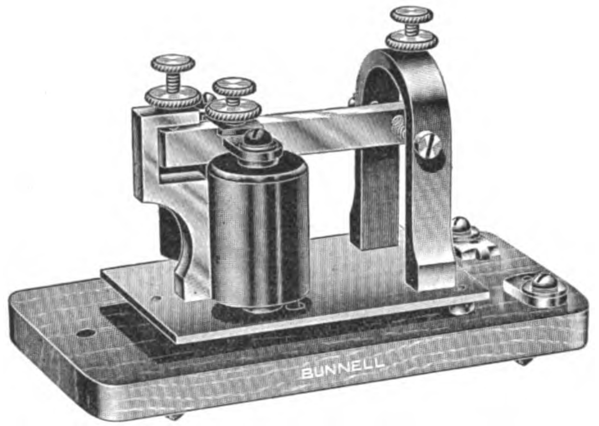

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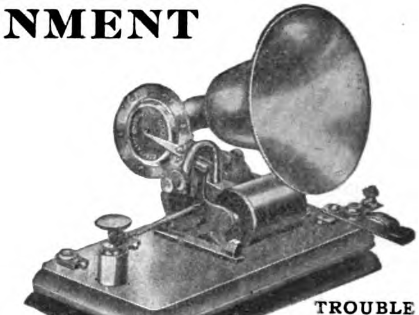

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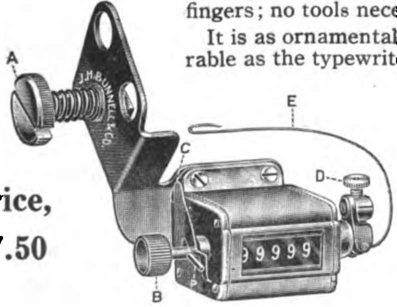

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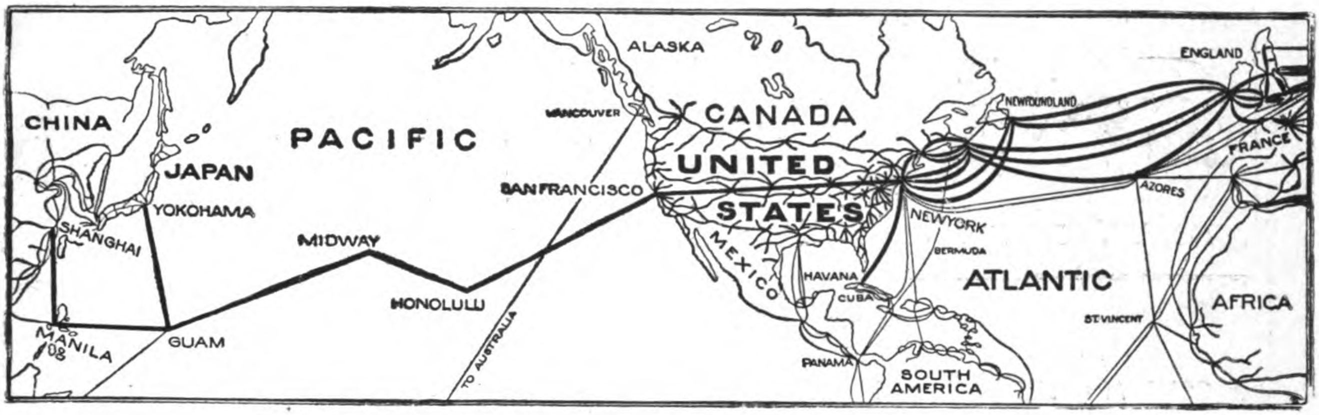

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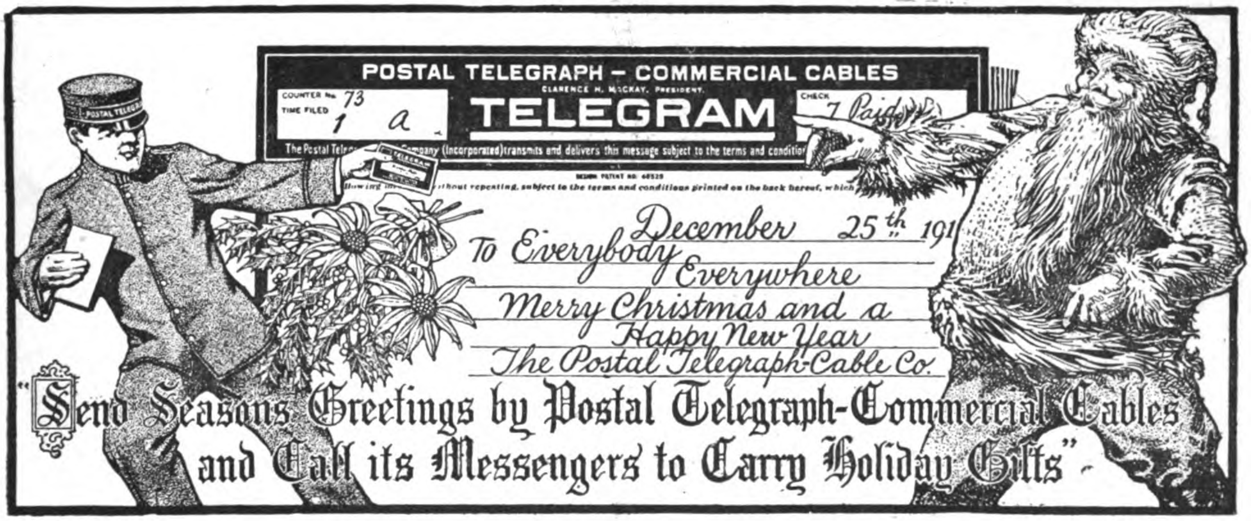

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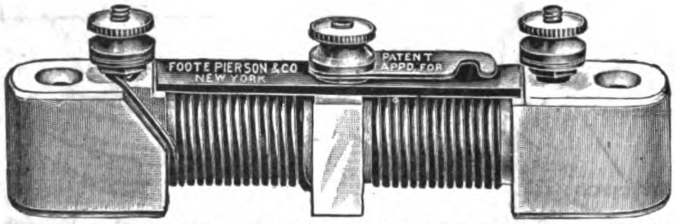

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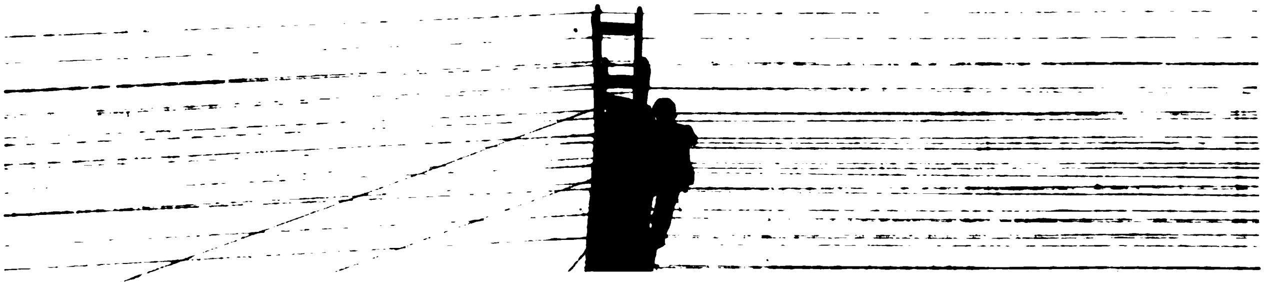

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